

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: BROD

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ART UNIT: 1302

FILED: April 12, 1996

SERIAL NO.: 08/631,470

EXAMINER: SAYALA, C

FOR: METHODS OF TREATING  
AUTO-IMMUNE DISEASES  
USING TYPE ONE INTERFERONS

DOCKET: D5716CIP2/CPA

Box NON-FEE AMENDMENT  
Assistant Commissioner of Patents  
Washington, D.C. 20231

Dear Sir:

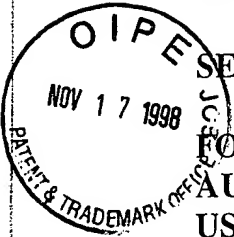
DECLARATION UNDER 37 C.F.R. 1.132

JERRY S. WOLINSKY does hereby state as follows:

I am a Professor of Neurology at the University of Texas Health Science Center in Houston, Texas. I am skilled in the areas of autoimmune diseases generally and multiple sclerosis in particular. My *curriculum vitae* is attached hereto.

I have read U. S. patent application Serial No. 08/631,470, filed on April 12, 1996, and I am aware of the contents of, and responses to, the Office Actions, including all prior art cited against the '470 application.

The Applicant's invention claimed in the above-referenced application is specifically concerned with the oral administration and ingestion of interferons in a therapeutic application for treatment of



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autoimmune disease such as multiple sclerosis. One of the major issues with respect to patentability of this application concerns whether it would have been obvious to a person having ordinary skill in this art at the time the parent application was filed, i.e., April 1994, to orally administer interferon to treat autoimmune diseases in view of the **Cummins** (US Patent 5,019,382). As described in detail *infra*, I believe the answer is clearly no.

The experimental database relied upon in the **Cummins** patent is extremely limited. Whereas reasonable information is provided for the treatment of shipping fever in cattle, **Cummins'** additional claims regarding administration of interferons to treat viral and inflammatory disease are based on pure speculation or limited anecdotal data. It is my considered opinion that none of the supporting evidence in **Cummins** is in any way adequate to allow a reasonable physician, i.e., a person with ordinary skill in the art, with a reasonable expectation of being able to successfully utilize oral administration of interferon for the treatment of inflammatory autoimmune diseases such as multiple sclerosis.

In **Cummins**, two patients with rheumatoid arthritis and one patient with multiple sclerosis were given alpha interferon, administered orally. The art taught in the **Cummins** application stresses that administration of interferon should be directed at absorption through the

oral mucosa, and not the gastric mucosa. Maximal contact with the oral or pharyngeal mucosa was emphasized as required; contact with the gastric or intestinal mucosa was considered therapeutically nugatory.

In distinction to this, the instant invention clearly provides detailed experimental evidence regarding the role of ingested interferon in the treatment of inflammatory autoimmune diseases in experimental animals and humans. For example, in the animal models of human autoimmune disease, the interferon is delivered directly into the stomach or duodenum of the animal. In this experimental protocol, contact with the oral or pharyngeal mucosa is explicitly avoided. Convincing data that shows that delivery of the dose of oral interferon must be into the post-duodenal small intestine in order to be effective is presented; this specific route of administration is quite unlike the oral mucosa swish technique described by **Cummins**. Furthermore, in Applicant's clinical studies with both normal human volunteers and patients with multiple sclerosis, the type one interferon dosage was "ingested". This very briefly exposed the oral/pharyngeal mucosa to the interferon, however no attempts at maximizing contact with the oral/pharyngeal mucosa were made, nor would there have been any significant absorption of the interferon through the oral or pharyngeal mucosa.

Further, Applicant's invention provides valuable information regarding the limits of its application for expectations of therapeutic benefits. Particularly important is Applicant's demonstration of an unusual dose-response relationship for oral administration of type one interferons to have any effect. It is meticulously demonstrated that both doses that are too low and doses that are too high lack any clinical benefit in animal models of human autoimmune disease, and it is concluded that similar restricted and unusual dose-response relationships are extant in man. Applicant's work thus defines a likely range of doses of type one oral interferons that would be clinically efficacious in humans with multiple sclerosis and other inflammatory autoimmune diseases.

Applicant additionally provides detailed information that illustrate a range of orally administered interferon doses which provide measurable changes in biological response markers in both normal human volunteers and patients with multiple sclerosis. No similar data was presented by Cummins and doses suggested by Cummins did not include the range of doses expected by Applicant to be effective based on animal or human data. The critical dose range taught by Applicant is not obtainable based on Cummins' route and method of administration and dosage range presented. The effective dosage levels supported by

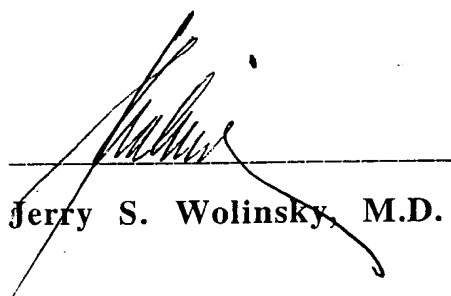
Applicant's extensive findings exceed the highest doses taught by **Cummins**.

Clearly, one with ordinary skill in the art of autoimmune pathophysiology and treatment could not anticipate any therapeutic effects in humans from the oral administration of type one interferons after having read the **Cummins** and **Shibutani** et al. references. One would, if anything, expect such administration to have no clinical effect based on this route of administration. As is well known, proteins are broken down in the gastrointestinal tract -- hence ingested interferon protein should be digested without any therapeutic consequences. Hence, any person with ordinary skill in this art would expect interferons to be biologically inert after being swallowed.

In conclusion, it is my opinion that the speculative and extremely limited anecdotal data presented in **Cummins** would in no way provide a person with ordinary skill in this art, e.g. a neurologist treating patients with inflammatory autoimmune diseases such as multiple sclerosis, with any prospect of being able to successfully treat such a disease via oral administration of type one interferons. Such a person could not have derived the approach detailed in the instant invention after having read the **Cummins** and **Shibutani** et al. references.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States code, and that such willful false statements may jeopardize the validity of the application or patent issued thereon.

DATE 8-13-98

  
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Jerry S. Wolinsky, M.D.

## CURRICULUM VITAE

Jerry S. Wolinsky, M. D.

August 13, 1998

### PRESENT TITLE

Professor of Neurology, The University of Texas - Houston, Health Science Center, School of Medicine, July, 1983-.  
Member of Graduate Faculty, The University of Texas - Houston, Health Science Center, Graduate School of Biomedical Sciences, January, 1984-.

### ADDRESS

The University of Texas - Houston, Health Science Center  
Department of Neurology  
6431 Fannin,  
Houston, Texas 77030

phone: (713) 500-7048  
fax: (713) 500-7041  
email: jswolinsky@aol.com.

### BIRTHDATE

November 26, 1943  
Baltimore, Maryland.

### CITIZENSHIP

USA

### UNDERGRADUATE EDUCATION

1962 - 1965, Illinois Institute of Technology, Chicago, Illinois.

### GRADUATE EDUCATION

1965 - 1969, University of Illinois College of Medicine, Chicago, Illinois.

### POSTGRADUATE EDUCATION

June 1969 - July 1970, Rotating Internship: Mt. Zion Hospital and Medical Center, San Francisco, California.  
July 1970 - June 1972, Resident in Neurology: University of California, San Francisco, California.  
July 1972 - June 1973, Chief Resident in Neurology: University of California, San Francisco, California.  
July 1973 - June 1975, Resident Clinical Associate in Neuropathology: Veterans Administration Hospital, San Francisco, California.

### MILITARY SERVICE

December 1970 - September 1977, USA Reserve, Hamilton Reserve Center, California; Commander 147th Medical Detachment, Presidio of San Francisco, California, 1971-1974.

### PAST ACADEMIC APPOINTMENTS

July 1973 - June 1975, Instructor in Neurology, University of California, San Francisco, California.  
July 1975 - June 1978, Assistant Professor of Neurology, University of California, San Francisco, California.  
July 1975 - June 1978, Research Associate, Veterans Administration Hospital, San Francisco, California.  
June 1978 - June 1983, Associate Professor of Neurology, The Johns Hopkins University School of Medicine, Baltimore, Maryland.

July 1981 - June 1983, Associate Professor of Immunology and Infectious Diseases, The Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland.

#### LICENSURE

Texas (G-4752) June 28, 1983 (current through 08-31-96).  
Maryland (D-2219) July 20, 1978 (inactive after 1991).  
California (G-20734) July 8, 1971 (inactive after 1987).

#### CERTIFICATION

National Board of Medical Examiners #105368, June 24, 1970.  
American Board of Psychiatry and Neurology, May 1975.

#### CURRENT HOSPITAL AFFILIATIONS

Hermann Hospital, Neurology Active Staff.

#### PROFESSIONAL ORGANIZATIONS

American Academy of Neurology, 1971- (Fellow 1980).  
American Academy for the Advancement of Science, 1973-, Fellow 1996-.  
San Francisco Neurology Society, 1973-1978.  
American Association of Neuropathologists, 1976-1989.  
American Society for Microbiology, 1976-.  
American Neurological Association, 1978-.  
Maryland Neurological Society, 1978-1983.  
Texas Medical Association, 1984-.  
American Society for Clinical Investigation, 1984-.  
American Society for Virology, 1984-.  
Houston Neurological Society, 1984-.  
Texas Neurological Society, 1985-.  
Harris County Medical Society, 1986-.

#### CONSULTANTSHIPS

Carter Wallace, Inc., 1991-1992.  
4-aminopyridine Multiple Sclerosis Treatment Trial Medical Advisory Group - Élan Pharmaceuticals Research Corporation, 1991-.  
Multiple Sclerosis Treatment Medical Advisory Board - Sandoz Pharmaceuticals, 1993-.  
Consultant, Berlex Laboratories, 1993-.  
Speakers Bureau, Health Science Communications, Inc., 1994-.  
Advisory Board - Biogen, 1994-.  
Clinical Advisory Committee - Viragen, Inc., 1994-.  
Co-Chairman, Linomide Multicenter Trial Executive Committee, Pharmacia, 1994-.  
Member, Independent Monitoring Board, Berlex Secondary Progressive Multiple Sclerosis Treatment Trial, 1995-.  
Multiple Sclerosis Advisory Board, Zeneca Pharmaceuticals, 1995.  
Multiple Sclerosis Consultant, Icos Corporation, 1995-.  
MRI and Clinical Trials Consultant, TEVA Pharmaceuticals, 1995-.  
Member, Data Safety Monitoring Board, Serono European and Canadian Relapsing-Remitting and Secondary Progressive Multiple Sclerosis Treatment Trials, 1995-.  
Member, Organizing Committee, Steering Committee (Clinical and MRI Subcommittees) and Data Safety Monitoring Board, TEVA European and Canadian MRI Outcome Trial of Copolymer 1 in Relapsing-Remitting Multiple Sclerosis, 1995-.  
Multiple Sclerosis Consultant, Boehringer Ingelheim, 1997.  
Clinical Advisory Committee - Anergen, 1997-.  
Multiple Sclerosis Consultant, Angiotech, 1998-.



Multiple Sclerosis Consultant, Astra, 1998-.

#### HONORS AND AWARDS

Phi Eta Sigma, 1963.  
Alpha Omega Alpha, 1968.  
David M. Olkon Scholarship, 1968-1969.  
Basil O'Connor Starter Research Grant, The National Foundation March of Dimes, 1975-1978.  
National Institutes of Health Research Career Development Award (1-K04-NS00443), 1979-1983.  
University of Texas Medical School Dean's Teaching Excellence List, 1984-1985  
University of Texas Medical School Dean's Teaching Excellence List, 1985-1986  
University of Texas Medical School Dean's Teaching Excellence List, 1987-1988  
University of Texas Medical School Dean's Teaching Excellence List, 1988-1989  
University of Texas Medical School Dean's Teaching Excellence List, 1990-1991  
University of Texas Graduate School of Biomedical Sciences Dean's Teaching Award, 1992-1993  
University of Texas Medical School Dean's Teaching Excellence List, 1993-1994  
*The Best Doctors in America*, Lucy Stec, editor, Woodward/White, Inc., 1992, 1994  
American Men & Women of Science  
Marquis *Who's Who in the South and Southwest* - 1995 and subsequent editions  
International Who's Who in Medicine, Second Edition  
Marquis *Who's Who in the World* - 1996  
Marquis *Who's Who in Medicine and Health Care*, First Edition - 1997  
*The Best Doctors in America: Central Region 1996-1997*, Steven W. Naifeh, editor, Woodward/White, Inc.  
Fellow, American Academy for the Advancement of Science, 1996.  
*Co-chair*, Multiple Sclerosis: Clinical Issues and Decisions, Summer Conference, San Francisco.  
McEwan Visiting Professorship and Lecturer, University of Toronto, October 23-24, 1997.

#### COMMITTEES

Scientific Program Committee, American Academy of Neurology, 1979-1981.  
Constitution Committee, American Association of Neuropathologists, 1978-1981.  
Neurology Resident Selection Committee, Johns Hopkins Hospital, 1979-1982.  
Awards Committee, American Association of Neuropathologists, 1981-1983.  
National Multiple Sclerosis Society Working Group on Trials of New Drugs in MS, 1982-1986.  
National Multiple Sclerosis Society Medical Advisory Committee on Trials of New Drugs in MS, 1986-1995; Chairman 1986-1989.  
Medical Advisory Board, Southeast Texas Chapter Multiple Sclerosis Society, 1983-Chairman, 1986-1989.  
University of Texas Medical School Biohazards Committee, 1983-1990; Chairman 1986-1990.  
Medical Advisory Board, Southwest Regional Guillain-Barre Society, 1984-.  
Ad Hoc Member National Institutes of Health Study Sections in Experimental Virology, Pathology A, Immunology A.  
National Institutes of Health Site Visit Team Member NINCDS.  
National Institutes of Health Special Review Committee Member NINDS.  
National Multiple Sclerosis Society Working Group on Neuroimaging, 1985-1986.  
University of Texas Medical School Self Study Subcommittee on Education, 1985.  
National Institutes of Health Immunological Sciences Study Section Member, 1985-1989.  
Southeast Texas Chapter Multiple Sclerosis Society, Board of Trustees, 1986-1989.  
University of Texas Health Science Center Scientific Council, 1986-1990.  
University of Texas Medical School Self Internal Review Committee on the Department of Internal Medicine, 1986-1987.  
American Neurological Association Joint Advisory Committee of the Annals of Neurology, 1987-1993; Chairman 1991-1993.  
National Multiple Sclerosis Society Clinics Committee, 1987-1991.  
National Multiple Sclerosis Society Medical Advisory Board and Medical Advisory Board Executive Committee, 1988-2001.

Member at large, International Medical Advisory Board, International Federation of Multiple Sclerosis Societies, 1988-  
National Institutes of Health Reviewers Reserve, 1989-1993.  
University of Texas Health Science Center Biohazards Committee, 1989-1992; Chairman 1986-1990.  
University of Texas Health Science Center Faculty Development Leave Committee, 1989-1990.  
University of Texas Medical School Faculty Development Leave Committee, Chairman 1989-1990.  
University of Texas Medical School, Department of Neurology Residency Program Co-ordinator 1989-1990.  
Program Director, Multiple Sclerosis Update 1989, Continuing Education Course of the University of Texas Medical  
School at Houston.  
University of Texas Medical School Faculty Appointments, Promotions and Tenure Committee, 1990-1997.  
Corresponding reviewer, Human Frontier Science Program 1990, 1991, 1992, 1994, 1996.  
Member-at-large, University of Texas Medical School Research and Development Program (MSRDP) Committee, 1991-  
1993.  
Measles Consultation Group, National Institute of Allergy and Infectious Diseases, Division of Microbiology and  
Infectious Diseases, 1991.  
Abstract Reviewer and Chair Neurovirology III Session, American Academy of Neurology, 1991.  
Program Director, Multiple Sclerosis Update Series 1991, Continuing Education Course of the University of Texas  
Medical School at Houston.  
Abstract Reviewer and Chair CNS Infections Session, American Academy of Neurology, 1992.  
Executive Committee for the Neuroscience Research Center, University of Texas Health Science Center at Houston,  
1992-1997.  
National Institutes of Health Special Emphasis Review Panel Member NINCDS, 1992.  
National Multiple Sclerosis Society Scientific Peer Review Committee "B", 1993-1998.  
National Institutes of Neurological Disorders and Stroke, Board of Scientific Counselors, Ad Hoc Member, 1992.  
University of Texas Medical School Internal Review Committee on the Department of Neurobiology and Anatomy,  
1992-1993.  
Member, Scientific Advisory Committee, The University of Texas Clinical Research Center at Hermann Hospital, 1993-;  
Chair 1996-.  
Co-Program Director, Multiple Sclerosis Update Series 1993, Continuing Education Course of the University of Texas  
Medical School at Houston.  
Annual Meeting Plenary Program Committee, American Neurological Association, 1993-1995.  
University of Texas Health Science Center Scientific Review Committee, 1994-.  
Chairman, University of Texas Medical School, Internal Review Committee on the Department of Internal Medicine,  
1995.  
Co-Program Director, Multiple Sclerosis Update 1995, Continuing Education Course of the University of Texas Medical  
School at Houston.  
Steering Committee and Program Committee, Americas Committee for Trial and Research in Multiple Sclerosis, 1996-.  
Member, International Working Party on the Use of Magnetic Resonance in Multiple Sclerosis, 1997-.

#### EDITORIAL POSITIONS

Editorial Board, Annals of Neurology, 1980-1987.  
Editorial Advisory Board, Critical Reviews in Clinical Neurobiology, 1983-1988.  
Editorial Board, Multiple Sclerosis: Clinical and Laboratory Research, 1994-.  
Editorial Board, Journal of Neurovirology, 1994-1996.  
Associate Editor, Scientific American Medicine, 1995-.

Frequent Ad Hoc Reviews for Annals of Neurology, Archives of Neurology, Archives of Virology, Clinical Microbiology  
Reviews, Journal of General Virology, Journal of Infectious Diseases, Journal of Neuroimmunology, Journal of  
Neuropathology and Experimental Neurology, Journal of Virology, Mayo Clinic Proceedings, Neurology, New  
England Journal of Medicine, Science, Southern Medical Journal, Virology, Virology Research.

#### SPONSORSHIP OF SUMMER STUDENTS

Fawn Lewis, MSIII - 1990

Jean-Paul Wolinsky, undergraduate - 1991, 1992, 1993  
Eve Rogers, MSII, 1993

#### SPONSORSHIP OF PRE-DOCTORAL FELLOWS

Joyce A. Kobori, M.D. - June 1977 - May 1978, Special Pre-doctoral Fellow National Multiple Sclerosis Society, Role of Subviral Particles in Disease Pathogenesis - Currently, Assistant Professor of Pediatrics and Molecular Genetics, Stanford University.

#### SPONSORSHIP OF GRADUATE DEGREE CANDIDATES

M. Neal Waxham, Ph.D., - September 1980 - May 1984, Ph.D. candidate, Immunology and Infectious Disease, Johns Hopkins University School of Hygiene and Public Health, Molecular Mechanisms of Rubella Virus Pathogenesis. - Currently, Associate Professor of Neurobiology and Anatomy, The University of Texas Health Science Center at Houston.

Amy Lovett, Ph.D. - June 1989 - May 1993, Ph.D. candidate, Program in Virology, Graduate School of Biomedical Sciences, The University of Texas - Houston, Health Science Center. Molecular Immune Determinants of Rubella Virus. - Currently, Post-doctoral Fellow, Neuroimmunology, Washington University, St. Louis.

Stephanie Edson, M.S. - June 1991 - August 1994, M.S. candidate, Program in Virology, Graduate School of Biomedical Sciences, The University of Texas - Health Science Center. Immunogenicity of a Prototype Chimeric Peptide Rubella Vaccine.

#### SPONSORSHIP OF POST-DOCTORAL FELLOWS

John B. Penney, Jr., M.D., July 1977 - June 1978, Veterans Administration Post-doctoral Fellow, Ultrastructure of Theiler's Virus Encephalitis - Currently, Professor of Neurology, Harvard Medical School.

Irma M. Parhad, M.D., June 1977 - July 1978, National Institutes of Health Post-doctoral Fellow, Ultrastructure of Measles Virus Infection - Currently, Assistant Professor of Neurology, Calgary University (*deceased*).

Micheline McCarthy, Ph.D., July 1978 - June 1980, National Institutes of Health Post-doctoral Fellow, Molecular Biology of Mumps Virus - Currently, Assistant Professor of Neurology, The University of Miami.

Patricia K. Coyle, M.D., July 1978 - June 1980, National Institutes of Health Post-doctoral Fellow, Immune Complexes in CNS Diseases - Currently, Professor of Neurology, The State University of New York (Stony Brook).

Alan Seay, M.D., July 1979 - June 1981, National Institutes of Health Teacher Investigator Awardee, Ross River Virus Encephalitis Demyelination - Currently, Associate Professor of Neurology and Pediatrics, The University of Colorado Health Science Center.

Alfred C. Server, M.D., Ph.D., July 1979 - June 1981, National Institutes of Health Post-doctoral Fellow, Immunochemical Characterization of Mumps Virus - Currently, Law Student, Harvard, Boston.

David C. Merz, M.D., Ph.D., January 1981 - June 1983, Special Post-doctoral Fellow, American Cancer Society, Molecular Aspects of Mumps Virus Pathogenesis - Currently, Assistant Professor of Medicine, Rochester University.

Betty Slagle, Ph.D., April 1985 - October 1986, Post-doctoral Fellow, National Multiple Sclerosis Society, Rubella Virus Receptor Interactions - Currently, Assistant Professor, Department of Virology, Baylor College of Medicine.

Avindra Nath, M.D., May 1986 - December 1988, Post-doctoral Fellow, Anti-idiotypic Antibodies to the Rubella Virus Receptor - Currently, Associate Professor, Department of Neurology, The University of Kentucky Health Science Center.

Rui Jin, M.D., April 1989 - July 1991, Post-doctoral Fellow, Molecular Neuroimmunology of Rubella Virus Epitopes and Proteolipid Protein Gene Alleles - Currently, Research Associate, Department of Neurology, The University of Texas Health Science Center at Houston.

#### GRADUATE STUDIES SUPERVISORY COMMITTEES

Lovely K. Fotedar, MS, In vivo Proton Magnetic Resonance Spectroscopy of Stress-induced Water Changes in Human Gastrocnemius Muscle.

Paul Kussie, PhD, Molecular Structure of Antibodies Against Small Ligands.

James C. Falconer, PhD, Quantitative MRI of Spinal Cord Injury: Correlative Studies.

Barry J. Bedell, PhD, Automatic Quantitation of Multiple Sclerosis Lesions on MR Images.

David Fenyes, MD/PhD, To be defined (February 1994 - ).

Nicholas Zacharopoulos, MS, MR diffusion tensor imaging of normal human brain with selective tissue suppression.

## CURRENT GRANTS

### PRINCIPAL INVESTIGATOR

Clayton Foundation for Research: Viral mimicry and multiple sclerosis, 1/01/93-12/31/98, total direct costs awarded to date: \$751,587; current year \$141,792.

TEVA Pharmaceuticals: Preclinical studies of copolymer 1; 10/01/96-09/30/1999; total direct costs projected: \$177,224.

TEVA Marion Partners: Protocol 01-9004, Open label study to evaluate the safety of Copaxone® and to monitor the neurologic course of disease in multiple sclerosis patients treated with Copaxone®; MRI Analysis Center; 04/01/98-10/15/99; total direct costs: \$166,012.

ICOS Corporation: Clinical study protocol A960002i, phase 2 study of Hu23F2G in acute exacerbations of multiple sclerosis; 12/01/96-10/31/98; total direct costs projected: \$319,328.

ICOS Corporation: Clinical study protocol AMS05, phase 2 study of Hu23F2G in acute exacerbations of multiple sclerosis; MRI Analysis Center; 04/01/98-03/31/99; total direct costs projected: \$158,358.

Biogen: Protocol C97-830: A randomized, double-blind, placebo-controlled study to evaluate the efficacy of Avonex® in the treatment of secondary progressive multiple sclerosis; 06/01/98-05/31/01; total direct costs projected: \$177,224.

Angiotech Pharmaceuticals: Clinical protocol 002-MPMS98-1, Micellar Paclitaxel for the treatment of secondary progressive multiple sclerosis; MRI Analysis Center; 07/21/98-06/30/00; total direct costs projected: \$105,641.

Biogen: CombiRx study of relapsing multiple sclerosis; MRI Analysis Center; 10/01/98-09/31/99; total direct costs projected: \$61,157.

### CO-INVESTIGATOR

National Institutes of Health: Serial spectroscopy and imaging of multiple sclerosis (RO1-NS31499), 04/01/93-03/31/02, total direct costs awarded: \$1,959,461; Dr. Ponnada A. Narayana is the principal investigator.

National Institutes of Health: Oral IFN- $\alpha$ : Biological effects in relapsing-remitting multiple sclerosis (RO1-NS35619), 04/01/97-03/31/99, total direct costs awarded: \$584,884; Dr. Staley A. Brod is the principal investigator.

TEVA Pharmaceuticals: Open label study to evaluate the safety of Copaxone® and to monitor the neurologic course of disease in multiple sclerosis patients treated with Copaxone®; 04/01/98-03/31/00; total direct costs projected: \$104,490 (subcontract through University of Maryland); Dr. J. William Lindsey is the principal investigator.

## PREVIOUS GRANTS

### PRINCIPAL INVESTIGATOR

VAH Career Development Award-Research Associate: Pathogenesis of Viral Related Diseases (RA-793), 7/75-6/78.

National Foundation - March of Dimes: Basil O'Connor Starter Research Grant: Pathogenesis of the Late Onset Progressive Rubella Panencephalitis Syndrome (5-63), 9/75-6/78.

VAH-BIS: Pathogenesis of Viral Related CNS Diseases (MRIS 9510), 7/76-6/78.

National Foundation - March of Dimes: Effects of Rubella Virus on Neural Tissues (1-642), 7/78-6/80.

National Institutes of Health: Neurovirulence and Persistence of Mumps Virus (1 RO1-A115721), 5/79-4/82.

United Cerebral Palsy Research and Educational Foundation: Pathogenesis of the Cerebral Palsy of Rubella Virus (R-319-84), 2/81-1/84.

United Cerebral Palsy Research and Educational Foundation: Pathogenesis of the Cerebral Palsy of Rubella Virus (R-319-84), 2/84-7/86, total direct costs awarded: \$105,166.

National Institutes of Health: Immunoglobulin Access to Neoantigens on CNS Cells. (1 RO1 NS20352-01), 12/83-4/87, total direct costs awarded: \$265,250.

National Multiple Sclerosis Society: Characterization of the Rubella Virus Receptor (RG 1855-A-1), 4/86-10/89, total direct costs awarded: \$251,940.

National Multiple Sclerosis Society: MRI Techniques to Study the Stages of Disease Activity (PP0064), 9/88-12/89, total direct costs awarded: \$19,029.

Sandoz Inc.: A Double-blind Multicenter Clinical Trial to Assess the Safety and Efficacy of Cyclosporine in the Treatment of Multiple Sclerosis, 1/85-12/90, total direct costs awarded: \$88,694.

National Multiple Sclerosis Society: Non-lethal Mutations in PLP and Multiple Sclerosis (PP0162), 08/01/90-07/31/91; total direct costs awarded: \$18,517.

Merck Sharp and Dohme: PCR Amplification of the Rubella Genome for Detection of Vaccine Persistence in Man, 8/01/89-04/30/93, total direct costs awarded: \$68,000.

National Institutes of Health: Molecular Immune Response Determinants of Rubella Virus (RO1 AI26943), 6/01/89-12/31/94, total direct costs awarded: \$792,050.

TEVA Pharmaceuticals: Copolymer I Therapy of Relapsing Multiple Sclerosis; 10/01/91-01/31/95; total direct costs: \$102,384 (subcontract through University of Maryland).

Athena Neurosciences: A multicenter, double-blind, randomized, placebo-controlled study to assess the efficacy and safety of Tizanidine and the relationship of plasma concentrations to the changes in muscle tone and common adverse events; 08/01/94-07/31/95; total direct costs: \$63,938.

Élan Pharmaceuticals Research Corporation: A Randomized, double-blind, placebo-controlled, titration study of Fampridine SR® administered BID to patients with multiple sclerosis; 09/01/94-08/31/95; total direct costs: \$53,911.

National Multiple Sclerosis Society: Does the CD3ε gene differ in multiple sclerosis; 02/01/95-1/31/96; total direct costs: \$18,750.

Athena Neurosciences: A multicenter, open-label, long-term study to evaluate the safety of Tizanidine tablets in patients suffering from spasticity due to multiple sclerosis; 08/01/94-07/31/97; total direct costs projected: \$82,043.

Pharmacia: Magnetic resonance imaging analysis center for: A randomized, double-blind, placebo-controlled, phase 3 study of roquinimex (Linomide®) in secondary progressive multiple sclerosis; 08/01/95-04/01/98; total direct costs: \$1,135,962.

TEVA Pharmaceuticals: Open label study to evaluate the safety of Copaxone® and to monitor the neurologic course of disease in multiple sclerosis patients treated with Copaxone®; 08/12/94-03/31/98; total direct costs projected: \$148,706 (subcontract through University of Maryland).

#### CO-INVESTIGATOR

NINCDS: Virology-Immunology-Pathology of Neurological (T32-NS07073), 7/76-6/78.

United Cerebral Palsy Research and Educational Foundation: Effects of Perinatal Infections on the Developing Nervous System (R-230-76), 1/80-12/81.

NINCDS: Neurovirology and Immunology Training Grant (TS NS07000), 7/80-6/83.

NINCDS: Cellular Dysfunction Neurological Diseases (NS-15721-02) 1/81-12/83.

NINCDS: Plasmapheresis of Acute Guillain-Barre (NS17053) 12/80-11/83.

NIAID: Herpes Simplex Encephalitis Collaborative Study (AI-12667-UAB-82).

National Multiple Sclerosis Society: Magnetic Resonance Imaging in Chronic Progressive Multiple Sclerosis, 4/86-3/89 (co-investigator with Donald Paty, M.D.), total direct costs awarded: \$176,388.

Retinitis Pigmentosa Foundation: The Role of Rubella Virus in Retinitis Pigmentosa, 7/89-6/90; subcontract through Dr. Lowell L. Williams, Ohio State University, total direct costs awarded subcontract: \$27,436.

National Institutes of Health: Purchase of a Laser Desorption/TOF Mass Spectrometer; total direct costs awarded \$315,000; Dr. R.M. Caprioli was the principal investigator of this BRS shared instrumentation grant.

National Multiple Sclerosis Society: Proton Magnetic Resonance Spectroscopy and Imaging of Multiple Sclerosis (RG 2236-A-1), 10/01/90-09/30/92, total direct costs awarded: \$140,246; Dr. Ponnada A. Narayana was the principal investigator.

National Multiple Sclerosis Society: Spectroscopy and Imaging of Multiple Sclerosis (RG 2236-B-2), 10/01/92-09/30/95, total direct costs awarded: \$319,624; Replaced by NIH award effective 04/01/93; Dr. Ponnada A. Narayana was the principal investigator.

Texas Higher Education Coordinating Board Advanced Research Program: Development of Advanced Magnetic Resonance Technology for the in vivo Evaluation of Neurologic Diseases (0116118072), 11/01/91-

10/31/93, total direct costs awarded \$128,211; Dr. Ponnada A. Nārayana was the principal investigator.

Neurocrine Biosciences: Double-blind, randomized, placebo-controlled evaluation of the safety, tolerability and pharmacokinetics of nbi-577 in patients with multiple sclerosis, protocol 01; 09/01/96-08/31/98; total direct costs: \$137,000; Dr. J. William Lindsey was the principal investigator.

Pharmacia: A randomized, double-blind, placebo-controlled, phase 3 study of roquinimex (Linomide®) in secondary progressive multiple sclerosis; 10/01/95-12/31/97; total direct costs: \$265,000; Dr. J. William Lindsey is the principal investigator

#### A. REFEREED ORIGINAL ARTICLES IN JOURNALS

1. Shirley B, *Wolinsky JS*, Schwartz NB (1968) Effects of a single injection of an estrogen antagonist on the estrous cycle of the rat. *Endocrinology* 82:959-968.
2. *Wolinsky JS*, Barnes BO, Margolis MT (1973) Diagnostic tests in normal pressure hydrocephalus. *Neurology* 23:706-713.
3. *Wolinsky JS*, Baringer JR, Margolis G, Kilham L (1974) Ultrastructure of mumps virus replication in newborn hamster central nervous system. *Lab Invest* 31:403-412.
4. Townsend JJ, *Wolinsky JS*, Baringer JR, Johnson PC (1975) Acquired toxoplasmosis: A neglected cause of treatable nervous system disease. *Arch Neurol* 32:335-343.
5. Townsend JJ, Baringer JR, *Wolinsky JS*, Malamud N, Mednick IP, Panitch HS, Scott RA, Oshiro LS, Cremer NE (1975) Progressive rubella panencephalitis: Late onset after congenital rubella. *N Engl J Med* 292:990-993.
6. Goldstein GW, *Wolinsky JS*, Csejtei J, Diamond I (1975) Isolation of metabolically active capillaries from rat brain. *J Neurochem* 25:715-717.
7. *Wolinsky JS*, Gilden DH (1975) In vivo studies of parainfluenza I (6/94) virus: Mononuclear cell interactions. *Arch Virol* 49:25-31.
8. Rorke L, Gilden DH, Wroblewska Z, *Wolinsky JS* (1976) Experimental panencephalitis induced in suckling mice by parainfluenza type I (6/94) virus: I. Clinical and pathological features. *J Neuropath Exp Neurol* 35:247-258.
9. Gilden DH, Wroblewska Z, Chesler M, Wellish MC, Lief FS, *Wolinsky JS*, Rorke LS (1976) Experimental panencephalitis induced in suckling mice by parainfluenza type I (6/94) virus II. Virological studies. *J Neuropath Exp Neurol* 35:259-270.
10. *Wolinsky JS*, Gilden DH, Rorke L (1976) Experimental panencephalitis induced in suckling mice by parainfluenza I (6/94) virus III. Ultrastructural features. *J Neuropath Exp Neurol* 35:271-286.
11. *Wolinsky JS*, Klassen T, Baringer JR (1976) Persistence of neuro-adapted mumps virus in brains of newborn hamsters after intraperitoneal inoculation. *J Infect Dis* 133:260-267.
12. *Wolinsky JS*, Kelly JM, Baringer JR (1976) Ultrastructure of mumps virus replication in organotypic cultures of hamster choroid plexus. *J Gen Virol* 30:197-205.
13. Townsend JJ, *Wolinsky JS*, Baringer JR (1976) The neuropathology of progressive rubella panencephalitis of late onset. *Brain* 99:81-90.
14. *Wolinsky JS*, Berg BO, Maitland CS (1976) Progressive rubella panencephalitis. *Arch Neurol* 33:722-723.
15. Rand KH, Johnson KP, Rubinstein LB, *Wolinsky JS*, Penney JB, Walker DL, Padgett BL, Merigan TC (1977) Adenine arabinoside in the treatment of progressive multifocal leukoencephalopathy: Use of urine cytology to assess response to

therapy. *Ann Neurol* 1:458-462.

16. Wolinsky JS, Swoveland P, Johnson KP, Baringer JR (1977) Subacute measles encephalitis complicating Hodgkin's disease in an adult. *Ann Neurol* 1:452-457.
17. Bogen C, Gilden DH, Wroblewska Z, Wolinsky JS (1977) Experimental infection of human leukocytes with parainfluenza 1 (6/94) virus. *Infect Immunity* 18:501-508.
18. Goldstein GW, Wolinsky JS, Csejtei J (1977) Isolated brain capillaries: A model of lead encephalopathy. *Ann Neurol* 1:235-239.
19. Wolinsky JS (1977) Mumps virus induced hydrocephalus in hamsters: Ultrastructure of the chronic infection. *Lab Invest* 37:229-236.
20. Wroblewska Z, Gilden DH, Wellish M, Rorke LB, Warren KG, Wolinsky JS (1977) Virus-specific intracytoplasmic inclusions in mouse brain produced by a newly isolated strain of Theiler's virus. I. Virology and morphologic studies. *Lab Invest* 37:229-236.
21. Wolinsky JS, Stroop WG (1978) Virulence and persistence of three prototype strains of mumps virus in newborn hamsters. *Arch Virol* 56:355-359.
22. Gilden DG, Wroblewska Z, Kindt V, Warren KG, Wolinsky JS (1978) Varicella-zoster infection of human brain cells and ganglion cells in tissue culture. *Arch Virol* 56:101-118.
23. Wolinsky JS, Dau PC, Buimovici-Klein E, Mednick IP, Berg BO, Lange PB, Cooper LZ (1979) Progressive rubella panencephalitis: Immunovirologic studies and results of isoprinosine therapy. *Clin Exp Immunol* 35:297-303.
24. Penney JP, Wolinsky JS (1979) Neuronal and oligodendroglia infection by the WW strain of Theiler's virus. *Lab Invest* 40:324-330.
25. Silbergeld EK, Wolinsky JS, Goldstein GW (1980) Electron probe microanalysis of isolated brain capillaries poisoned with lead. *Brain Res* 198:369-376.
26. Parhad IM, Johnson KP, Wolinsky JS, Swoveland P (1980) Measles retinopathy. A hamster model of acute and chronic lesions. *Lab Invest* 43:52-60.
27. Coyle PK, Brooks BR, Hirsch RL, Cohen SR, O'Donnell P, Johnson RT, Wolinsky JS (1980) Cerebrospinal fluid lymphocyte populations and immune complexes in active multiple sclerosis. *Lancet* 2:229-232.
28. Wolinsky JS, Ellenbogen K, Chang R, Cantrell BB (1980) Herpes simplex encephalitis. *Johns Hopkins Med J* 147:157-163.
29. Parhad IM, Johnson KP, Wolinsky JS, Swoveland P (1981) Encephalitis after inhalation of measles virus. A pathologic study in hamsters. *Ann Neurol* 9:21-27.
30. Bowman PD, Betz AL, Ar D, Wolinsky JS, Penney JB, Shivers RR, Goldstein GW (1981) Primary culture of capillary endothelium from rat brain. *In Vitro* 17:353-362.
31. Coyle PK, Wolinsky JS (1981) Characterization of immune complexes in progressive rubella panencephalitis. *Ann Neurol* 9:557-562.
32. Narayan O, Clements JE, Griffin DE, Wolinsky JS (1981) Neutralizing antibody spectrum determines the antigenic

profiles of emerging mutants of visna virus. *Infect Immunity* 32:1045-1050.

33. Merz DC, *Wolinsky JS* (1981) Biochemical features of mumps virus neuraminidases and their relationship with pathogenicity. *Virology* 114:218-227.
34. McCarthy M, *Wolinsky JS*, Lazzarini RA (1981) A persistent infection of Vero cells by an egg-adapted mumps virus. *Virology* 114:343-356.
35. Wroblewska Z, Wellish MC, *Wolinsky JS*, Gilden D (1981) Comparison of human cytomegalovirus growth in MRC-5 human fibroblasts, brain and choroid plexus cells *in vitro*. *J Med Virol* 8:245-256.
36. Server AC, Merz DC, Waxham MN, *Wolinsky JS* (1982) Differentiation of mumps virus strains using monoclonal antibody to the HN glycoprotein. *Infect Immunity* 35:179-186.
37. *Wolinsky JS*, Jubelt B, Burke S, Narayan O (1982) The hematogenous origin of the inflammatory response in acute poliomyelitis. *Ann Neurol* 11:58-68.
38. Townsend JJ, Stroop WG, Baringer JR, *Wolinsky JS*, McKerrow JJ, Berg BO (1982) Neuropathology of progressive rubella panencephalitis after childhood rubella. *Neurology* 32:185-190.
39. *Wolinsky JS*, Waxham MN, Hess JL, Townsend JJ, Baringer RJ (1982) Immunochemical features of a case of progressive rubella panencephalitis. *Clin Exp Immunol* 48:359-366.
40. Poduslo S, Miller K, *Wolinsky JS* (1982) The assembly of a unique membrane by purified oligodendroglia maintained in culture. *Exp Cell Res* 137:203-215.
41. Seay AR, *Wolinsky JS* (1982) Ross River virus-induced demyelination. I. Pathogenesis and histopathology. *Ann Neurol* 12:380-389.
42. Coyle PK, *Wolinsky JS*, Buimovici-Klein E, Moncha R, Cooper LZ (1982) Rubella specific circulating immune complexes following congenital infection and vaccination. *Infect Immunity* 36:498-503.
43. Narayan O, *Wolinsky JS*, Clements JE, Strandberg JD, Griffin DE, Cork LC (1982) Slow virus replication: The role of macrophages in the persistence and expression of visna viruses of sheep and goats. *J Gen Virol* 59:345-356.
44. Schwendemann G, *Wolinsky JS*, Hatzidimitriou G, Merz D, Waxham MN (1982) Post-embedding immunocytochemical localization of paramyxovirus antigens by light and electron microscopy. *J Histochem Cytochem* 30:1313-1319.
45. Fisher R, Clark AW, *Wolinsky JS*, Parhad IM, Mosses H, Mariney MR (1983) Post infectious leukoencephalitis complicating infection with mycoplasma pneumoniae. *Arch Neurol* 40:109-113.
46. Merz DC, Server AC, Waxham MN, *Wolinsky JS* (1983) Biosynthesis of mumps virus F glycoprotein: Nonfusing strains efficiently cleave the F glycoprotein precursor. *J Gen Virol* 64:1457-1467.
47. Waxham MN, *Wolinsky JS* (1983) Immunochemical identification of rubella virus hemagglutinin. *Virology* 126:194-203.
48. Hilt DC, Buchholz D, Krumholz A, Weiss H, *Wolinsky JS* (1983) Herpes zoster ophthalmicus and delayed contralateral hemiparesis due to cerebral angiitis: Diagnosis and management approaches. *Ann Neurol* 14:543-553.
49. Tennekoon G, Zaruba M, *Wolinsky JS* (1983) Topography of cerebroside sulfotransferase in golgi enriched vesicles from rat brain. *J Cell Biol* 97:1107-1112.



50. Seay AR, *Wolinsky JS* (1983) Ross River virus-induced demyelination: II. Ultrastructural studies. *Ann Neurol* 14:559-568.
51. Merz C, *Wolinsky JS* (1983) Conversion of nonfusing mumps virus infections to fusing infections by selective proteolysis of the HN glycoprotein. *Virology* 131:328-340.
52. Hirst LW, Clark AW, *Wolinsky JS*, Zee DS, Kaiser H, Miller NR, Tutschka PJ, Santos GW (1983) Downbeat nystagmus. A case report of herpetic brain stem encephalitis. *J Clin Neuropath* 3:245-249.
53. Johnson RT, Griffin DE, Hirsch RL, *Wolinsky JS*, Roedenbeck S, deSoriano IL, Vaisberg A (1984) Measles encephalitis: Clinical and Immunological studies. *N Engl J Med* 310:137-141.
54. Gendelman HE, *Wolinsky JS*, Johnson RT, Pressman NJ, Pezeshkpour GH, Boisset GF (1984) Measles encephalitis: Lack of evidence of viral invasion of the central nervous system and quantitative study on the nature of demyelination. *Ann Neurol* 15:353-360.
55. Aoki T, Drachman DB, Asher DM, Gibbs Jr. CJ, Bahmanyar S, *Wolinsky JS* (1985) Attempts to implicate viruses in myasthenia gravis. *Neurology* 35:185-192.
56. *Wolinsky JS*, Waxham MN, Server AC (1985) Protective effects of glycoprotein specific monoclonal antibodies on the course of mumps virus meningoencephalitis. *J Virol* 53:727-734.
57. Waxham MN, *Wolinsky JS* (1985) A model of the structural organization of rubella virus. *Rev Infect Dis* 7(1):S133-S139.
58. The Guillain-Barre Study Group (1985) The effect of plasmapheresis on the acute Guillain-Barre syndrome. *Neurology* 35:1096-1104.
59. Waxham MN, *Wolinsky JS* (1985) Detailed immunologic analysis of the structural polypeptides of rubella virus using monoclonal antibodies. *Virology* 143:153-165.
60. Gendelman HE, Pezeshkpour GH, Pressman NJ, *Wolinsky JS*, Quarles RH, Doberson MJ, Trapp BD, Kitt C, Akasamit A, Johnson RT (1985) A quantitation of myelin-associated glycoprotein and myelin basic protein loss in different demyelinating diseases. *Ann Neurol* 18:324-328.
61. Server AC, Smith JA, Waxham MN, *Wolinsky JS*, Goodman HM (1985) Purification and amino terminal protein sequence analysis of the mumps virus fusion protein. *Virology* 144:373-383.
62. Hirsch RL, *Wolinsky JS*, Winkelstein JA (1986) Activation of the alternative complement pathway by mumps infected cells: Relationship to viral neuraminidase activity. *Arch Virol* 87:181-190.
63. Whitley RJ, Alford CA, Hirsch MS, Schooley RT, Luby JP, Aoki FY, Hanley D, Nahmias AJ, Soong S-J, and the NIAID Collaborative Antiviral Study Group (1986) Vidarabine versus acyclovir therapy in herpes simplex encephalitis. *New Engl J Med* 314:144-149.
64. Waxham MN, *Wolinsky JS* (1986) A fusing mumps virus variant selected from a non-fusing parent with the neuraminidase inhibitor 2-deoxy-2,3-dehydro-N-acetylneuraminic acid. *Virology* 151:286-295.
65. deMazancourt A, Waxham MN, Nicolas JC, *Wolinsky JS* (1986) Antibody response to the rubella virus structural proteins in infants with the congenital rubella syndrome. *J Med Virology* 19:111-122.
66. Waxham MN, Merz DC, *Wolinsky JS* (1986) Intracellular maturation of mumps virus hemagglutinin-neuraminidase

protein: Conformational changes detected with monoclonal antibodies. *J Virol* 59:392-400.

67. Narayana PA, *Wolinsky JS*, Jensen DJ (1987) Magnetic resonance imaging of experimental mumps meningoencephalitis in suckling hamsters. *Mag Res Med* 4:597-601.
68. Waxham MN, Server AC, Goodman HM, *Wolinsky JS* (1987) Cloning and sequencing the mumps virus fusion protein gene. *Virology* 159:381-388.
69. Kerman RH, *Wolinsky JS*, Nath A, Sears Jr. ES (1988) Serial immune evaluation in cyclosporine and placebo treated chronic progressive multiple sclerosis patients. *J Neuroimmunol* 18:325-331.
70. Waxham MN, Aronowski J, Server AC, *Wolinsky JS*, Smith JA, Goodman HM (1988) Sequence determination of the mumps virus HN gene. *Virology* 164:318-325.
71. Nath A, *Wolinsky JS*, Kerman RH (1989) Effect of cyclosporine on rubella-specific immune response in chronic progressive multiple sclerosis. *J Neuroimmunol* 22:143-148.
72. Narayana PA, Fotedar LK, Jackson EF, Bohan TP, Butler II, *Wolinsky JS* (1989) Regional in vivo proton magnetic resonance spectroscopy of brain. *J Mag Res* 83:44-52.
73. Nath A, Slagle B, *Wolinsky JS* (1989) Anti-idiotypic antibodies to rubella virus. *Arch Virol* 107:159-167.
74. Nath A, Kerman RH, Novak IS, *Wolinsky JS* (1990) Immune studies in human immunodeficiency virus infection with myasthenia gravis: A case report. *Neurology* 40:581-583.
75. Nath A, *Wolinsky JS* (1990) Antibody response to rubella virus structural proteins in multiple sclerosis. *Ann Neurol* 27:533-536.
76. *Wolinsky JS*, The Multiple Sclerosis Study Group (1990) Efficacy and toxicity of cyclosporine in chronic progressive multiple sclerosis: A randomized, double-blinded, placebo-controlled clinical trial. *Ann Neurol* 27:591-605.
77. *Wolinsky JS*, Narayana PA, Fenstermacher MJ (1990) Proton magnetic resonance spectroscopy in multiple sclerosis. *Neurology* 40:1764-1769.
78. *Wolinsky JS*, McCarthy M, Allen-Cannady O, Moore MT, Jin R, Cao S-N, Lovett A, Simmons D (1991) A monoclonal antibody defined epitope map of expressed rubella virus protein domains. *J Virol* 65:3986-3994.
79. Moore WT, *Wolinsky JS*, Suter MJ-F, Farmer TB, Caprioli RM (1992) Immunoreactive synthetic peptide epitope mapping with structural validation using electrospray mass spectrometry. In *Techniques in Protein Chemistry III*, RH Angeletti ed, Academic Press, San Diego, pp 183-197.
80. Narayana PA, *Wolinsky JS*, Jackson EF, McCarthy M (1992) Proton magnetic resonance spectroscopy of gadolinium-DTPA enhanced multiple sclerosis plaques. *JMRI* 2:263-270.
81. Williams LL, *Wolinsky JS*, Cao S-N, Shannon BT, Leguire LE (1992) Antibody response to rubella virus antigen and structural proteins in retinitis pigmentosa. *J Infect Dis* 166:525-530.
82. Williams LL, Lew HM, Shannon BT, Singley CT, Pelok SD, Davidorf FH, Jin R, *Wolinsky JS* (1993) Phagocytosis of latex beads is defective in cultured human retinal pigment epithelial cells with persistent rubella virus infection. *Amer J Path* 142:451-461.
83. Lovett A, McCarthy M, *Wolinsky JS* (1993) Mapping cell-mediated immunodominant domains of the rubella virus

structural proteins using recombinant proteins and synthetic peptides. *J Gen Virol* 74:445-452.

84. McCarthy M, Lovett A, Kerman RH, Overstreet A, *Wolinsky JS* (1993) Immunodominant T-cell epitopes of rubella virus structural proteins defined by synthetic peptides. *J Virol* 67:673-681.

85. *Wolinsky JS*, Sukholutsky E, Moore WT, Lovett A, McCarthy M, Adame B (1993) An antibody and synthetic peptide defined rubella virus E1 glycoprotein neutralization domain. *J Virol* 67:961-968.

86. Jackson EF, Narayana PA, *Wolinsky JS*, Doyle TJ (1993) Accuracy and reproducibility in volumetric analysis of multiple sclerosis lesions. *J Computer Assisted Tomography* 17:200-205.

87. Karounos DG, *Wolinsky JS*, Thomas JW (1993) Monoclonal antibody to rubella virus capsid protein recognizes a  $\beta$ -cell antigen. *J Immunol* 150:3080-3085.

88. Lovett A, Hahn CS, Rice C, Frey TK, *Wolinsky JS* (1993) Rubella-specific CTL responses: Identification of the capsid as a target of MHC class I-restricted lysis and definition of two epitopes. *J Virol* 67:5849-5858.

89. Williams LL, Lew HM, Davidorf FH, Pelok SD, Singley CT, *Wolinsky JS* (1994) Altered membrane fatty acids of cultured human retinal pigment epithelium persistently infected with rubella virus may affect secondary cellular function. *Arch Virol* 134:379-392.

90. Jackson EF, Doyle TJ, *Wolinsky JS*, Narayana PA (1994) Short echo-time  $^1\text{H}$  spectroscopic imaging of normal human brain: Reproducibility studies. *JMRI* 4:545-551.

91. Doyle TJ, Pathak R, *Wolinsky JS*, Narayana PA (1995) Automated proton spectroscopic image processing. *JMRI Series B* 106:58-63.

92. Brod SA, Khan M, Bright J, Sriram S, Marshall Jr. GD, Henninger EM, Kerman RH, *Wolinsky JS* (1995) Decreased CD3 mediated IFN- $\gamma$  production in relapsing-remitting multiple sclerosis. *Ann Neurol* 37:546-549.

93. Johnson, KP, Brooks BR, Cohen J, Ford CC, Goldstein J, Lisak RP, Myers LW, Panitch HS, Rose JW, Schiffer RB, Vollmer T, Weiner LP, *Wolinsky JS*, and The Copolymer 1 Multiple Sclerosis Study Group (1995) Copolymer 1 reduces the relapse rate and improves disability in relapsing-remitting multiple sclerosis: Results of a phase III multicenter, double-blind, placebo-controlled trial. *Neurology* 45:1268-1276.

94. Brod SA, Khan M, Marshall GD, Henninger EM, Kerman RH, *Wolinsky JS* (1996). Interferon- $\beta_{16}$  decreases tumor necrosis factor TNF- $\alpha$  and increases IL-6 production in multiple sclerosis. *Neurology* 46:1633-1638.

95. Frenkel LM, Nielsen K, Garakian A, Jin R, *Wolinsky JS*, Cherry JD (1996) A search for persistent rubella virus infection in persons with chronic symptoms after natural rubella or rubella immunization and in children with juvenile rheumatoid arthritis. *Clin Infect Dis* 22:287-294.

96. Koopmans RA, Li DKB, *Wolinsky JS*, Zhao GI, Mietlowski W, Redekop WK, Paty DW, and The Multiple Sclerosis Study Group (1997) Clinical and MRI changes correlate in a clinical trial monitoring cyclosporine therapy of MS. *J Neuroimaging* 7:126-132.

97. Bedell BJ, Narayana PA, *Wolinsky JS* (1997) A dual approach for minimizing false lesion classifications on magnetic resonance images. *Mag Res Med* 37:94-102.

98. Brod SA, Kerman RH, Nelson L, Marshall GD, Henninger EM, Khan M, Jin R, *Wolinsky JS* (1997) Ingested IFN $\alpha$  has biological effects in humans. *MS Clin Lab Res* 3:1-7.

99. Meitsch K, Enders G, *Wolinsky JS*, Faber R, Pustowoit B (1997) The role of Rubella-immunoblot and Rubella-Peptide-EIA for the diagnosis of the congenital Rubella syndrome during the prenatal and newborn periods. *J Med Virol* 51:280-283.
100. Brod SA, Nelson L, Khan M, *Wolinsky JS* (1997) IFN $\beta$ -1b treatment of relapsing multiple sclerosis has no effect on CD3-induced inflammatory or counterregulatory anti-inflammatory cytokine secretion ex vivo after nine months. *Int J Neurosci* 90:135-144.
101. Brod SA, Nelson L, Khan M, *Wolinsky JS* (1997) Increased in vitro induced CD4+ and CD8+ T cell IFN $\gamma$  and CD4+ T cell IL-10 production in stable relapsing-remitting multiple sclerosis. *Int J Neurosci* 90:187-202.
102. Lindsey JW, Kerman RH, *Wolinsky JS* (1997) T cell-T cell activation in multiple sclerosis. *Multiple Sclerosis* 3:238-242.
103. Narayana PA, Doyle TJ, Lai D, *Wolinsky JS* (1998) Serial proton magnetic resonance spectroscopic imaging, contrast enhanced magnetic resonance imaging, and quantitative lesion volumetry in multiple sclerosis. *Ann Neurol* 43:56-71.
104. Johnson, KP, Brooks BR, Cohen J, Ford CC, Goldstein J, Lisak RP, Myers LW, Panitch HS, Rose JW, Schiffer RB, Vollmer T, Weiner LP, *Wolinsky JS*, and The Copolymer 1 Multiple Sclerosis Study Group (1998) Extended use of glatiramer acetate (Copaxone) is well tolerated and maintains its clinical effect on multiple sclerosis relapse rate and degree of disability. *Neurology* 50:701-708.
105. Brod SA, Nelson L, *Wolinsky JS* (1998) Ingested IFN- $\alpha$  induces Mx mRNA in mice and man. (Submitted).

#### ARTICLES DERIVED FROM MULTI-CENTERED CLINICAL INVESTIGATIONS

1. Whitley RJ, Alford CA, Hirsch MS, Schooley RT, Luby JP, Aoki FY, Hanley D, Nahmias AJ, Soong S-J, NIAID Collaborative Antiviral Study Group (1987) Factors indicative of outcome in a comparative trial of acyclovir and vidarabine for biopsy-proven herpes simplex encephalitis. *Infection* 15 (Suppl 1):3-8.
2. McKhann GM, Griffin JW, Cornblath DR, Mellits ED, Fisher RS, Quaskey SA and the Guillain-Barre Syndrome Study Group (1988) Plasmapheresis and Guillain-Barre syndrome: Analysis of prognostic factors and the effect of plasmapheresis. *Ann Neurol* 23:347-353.
3. Cornblath DR, Mellits ED, Griffin JW, McKhann GM, Albers JW, Miller RG, Feasby TE, Quaskey SA and the Guillain-Barre Syndrome Study Group (1988) Motor conduction studies in Guillain-Barre syndrome: Description and prognostic value. *Ann Neurol* 23:354-359.
4. Nelson LM, Franklin GM, Jones MC and the Multiple Sclerosis Study Group (1988) Risk of multiple sclerosis exacerbation during pregnancy and breast-feeding. *JAMA* 259:3441-3443.
5. Whitley RJ, Cobbs CG, Alford CA, Soong S-J, Hirsch MS, Connor JD, Corey L, Hanley DF, Levin M, Powell DA, NIAID Collaborative Antiviral Study Group (1989) Diseases that mimic herpes simplex encephalitis. Diagnosis, presentation, and outcome. *JAMA* 262:234-239.
6. Belendiuk G, Klatzman D, Mietlowski W and the MS Study Group (1989) Rating scales in assessment of multiple sclerosis. In *Quantitative Evaluation of Neurologist Function*, R Davis, GV Kondraske, WW Tourtellotte, K Syndulko, eds., Hanley and Belfus, Inc., Philadelphia, pp 177-184.
7. Soong S-J, Watson NE, Caddell GR, Alford CA, Whitley RJ, NIAID Collaborative Antiviral Study Group (1991) Use of brain biopsy for diagnostic evaluation of patients with suspected herpes simplex encephalitis: A statistical model and its clinical implications. *J Infect Dis* 163:17-22.

## B. CHAPTERS

1. Wolinsky JS (1978) Progressive rubella panencephalitis. In *Handbook of Clinical Neurology, Vol 34, part 2*, PJ Vinken, GG Bruyn, eds, North Holland Publishing Company, Amsterdam, pp 331-341.
2. Johnson KP, Wolinsky JS, Ginsberg AH (1978) Immune mediated syndromes of the nervous system related to virus infections. In *Handbook of Clinical Neurology, Vol 34, part 2*, PJ Vinken, GW Bruyn, eds, North Holland Publishing Company, Amsterdam, pp 391-434.
3. Johnson KP, Wolinsky JS, Swoveland P (1978) Central nervous system infections (chronic). In *CRC Handbook Series in Clinical Laboratory Science, Virology and Rickettsiology Section, H, Vol 1, part 2*, Hsiung GD, Green R, eds, CRC Press, Cleveland, pp 295-307.
4. Wolinsky JS (1978) Viral meningoencephalitis. In *Current Therapy*, HF Conn, ed, WB Saunders Company, Philadelphia, pp 705-707.
5. Wolinsky JS (1979) Viral Disease. In *Electron Microscopy in Human Medicine*, IV Johannessen, ed, Vol 6, McGraw-Hill, London, pp 54-84.
6. Wolinsky JS, Johnson RT (1980) Role of viruses in chronic neurological disease: In *Comprehensive Virology, Vol 9, Viral Persistence and Slow Viruses*, H Fraenkel-conrat and RR Wagner, eds, Plenum Press, New York, pp 257-296.
7. Wolinsky JS, Coyle PK (1980) Progressive rubella panencephalitis. In *Search for the Cause of MS and Other Chronic Disease of the CNS*, A Boese, ed, Verlag Chemie, Weinham, pp 266-271.
8. Wolinsky JS, Hatzidimitriou G, Waxham MN, Burke S (1981) Immunocytochemical localization of mumps virus antigens in vivo by light microscopy. In *The Replication of Negative Strand Viruses*, DHL Bishop, RW Compans, eds, Elsevier North Holland, New York, pp 609-614.
9. Server AC, Wolinsky JS (1982) Approaches to antiviral therapy. In *Human Motor Neuron Diseases*, LP Rowland, ed, Raven Press, New York, pp 523-550.
10. Mobley WC, Wolinsky JS (1982) Scientific overview of inflammatory demyelinating polyneuropathy and design of the North American collaborative study of plasma exchange in Guillain-Barre syndrome. In *Therapeutic Apheresis and Plasma Perfusion*, R Tindall, ed, AR Liss, New York, pp 159-187.
11. Wolinsky JS (1984) Slow virus infection by conventional virus agents. In *Infectious Diseases of the Central Nervous System*, RA Thompson, JR Green, eds, SP Medical and Scientific Books, New York, pp 19-45.
12. Waxham MN, Wolinsky JS (1984) Rubella virus and its effects on the central nervous system. *Neurologic Clinics* 2:367-385.
13. Wolinsky JS, Waxham MN, Server AC, Merz DC (1984) Treatment of experimental mumps meningoencephalitis using monoclonal antibodies. In *Nonsegmented Negative Strand Viruses*, DHL Bishop, RW Compans, eds, Academic Press, Orlando, pp 443-450.
14. Wolinsky JS, Server AC (1985) Chapter 53: Mumps Virus. In *Virology*, BN Fields, DM Knipe, RM Chanock, JL Melnick, B Roizman, RE Shope, eds, Raven Press, New York, pp 1255-1284.
15. Wolinsky JS (1985) CNS complications of viral infections and vaccines. Reye's Syndrome. Neurologic complications in the immunologically compromised host. All In *Cecil Textbook of Medicine, 17th Edition*, JB Wyngaarden, LH Smith, Jr, F Plum, eds, WB Saunders, Co, Philadelphia, pp 2139, 2141 and 2141.

16. Wolinsky JS (1987) Acute inflammatory polyneuritis. In *Current Therapy in Internal Medicine - 2*, TM Bayless, MC Brain, RM Cherniack, eds, BC Decker, Inc, Toronto, pp 1341-1343.
17. Wolinsky JS (1987) Acute inflammatory polyneuritis. In *Current Therapy in Neurologic Disease-2*, RT Johnson, ed, BC Decker, Inc, Toronto, pp 314-316.
18. Kandt RS, Gendelman HE, D'Souza BJ, Wolinsky JS, Kaplan RA, Mobley WC (1987) Infections of the central nervous system. In *Pediatric Emergency Medicine* FE Erlich, FJ Heldrich, JJ Tepas, III, eds, Apsen Publishers, Inc, Rockville, pp 129-168.
19. Wolinsky JS (1988) Subacute sclerosing panencephalitis. Central nervous system complications of viral infections and vaccines. Reye Syndrome. Neurologic complications in the immunologically compromised host. All In *Cecil Textbook of Medicine, 18th Edition*, JB Wyngaarden, FH Smith, Jr, F Plum, eds, W B Saunders Co, Philadelphia, pp 2206-2207, 2208-2211.
20. Wolinsky JS (1988) Rubella virus and its effects on the developing central nervous system. In *Viral Infections and the Developing Nervous System*, RT Johnson, G Lyon, eds, Kluwer Academic Pub, Dordrecht, pp 125-142.
21. Slagle BL, Wolinsky JS (1989) Rubella virus and the central nervous system. In *Clinical and Molecular Aspects of Viral Illnesses of the Nervous System*, DH Gilden, H Lipton, eds, Kluwer Academic Pub, Boston, pp 301-318.
22. Wolinsky JS (1989) Viral infections of the nervous system - Slow virus disease. In *Textbook of Internal Medicine*, W Kelley, ed, J B Lippincott Co, Philadelphia, pp 2414-2418.
23. Wolinsky JS (1989) Progressive rubella panencephalitis. In *Handbook of Clinical Neurology, Viral Disease, Vol 12 (56)*, RR McKendall, PJ Vinken, GG Bruyn, HL Klawans, eds, Elsevier Publishers, Amsterdam, pp 405-416.
24. Wolinsky JS (1990) Chapter 28: Rubella Virus. In *Virology, 2nd Edition*, BN Fields, DM Knipe, RM Chanock, JL Melnick, B Roizman, RE Shope, eds, Raven Press, New York, pp 815-840.
25. Wolinsky JS, Waxham MN (1990) Chapter 36: Mumps Virus. In *Virology, 2nd Edition*, BN Fields, DM Knipe, RM Chanock, JL Melnick, B Roizman, RE Shope, eds, Raven Press, New York, pp 989-1012.
26. Wolinsky JS (1990) Subacute sclerosing panencephalitis, progressive rubella panencephalitis and progressive multifocal leukoencephalopathy. In *Immunologic Mechanisms in Neurologic and Psychiatric Disease*, BH Waksman ed, Raven Press, New York, pp 259-268.
27. Wolinsky JS (1992) Chapter 473 Slow virus diseases, including AIDS dementia. In *Textbook of Internal Medicine, 2nd Edition*, W Kelley, ed, J B Lippincott Co, Philadelphia, pp 2216-2220.
28. Wolinsky JS (1992) Central nervous system complications of viral infections and vaccines. Reye Syndrome. Neurologic complications in the immunologically compromised host. All In *Cecil Textbook of Medicine, 19th Edition*, JB Wyngaarden, FH Smith, Jr, F Plum, eds, W B Saunders Co, Philadelphia, pp 2193-2196.
29. Wolinsky JS (1992) Treatment of Multiple Sclerosis with Cyclosporine A. In *Treatment of Multiple Sclerosis: Trial Design, Results and Future Perspectives*, R A Rudick and D E Goodkin, eds, Springer-Verlag, London, pp 217-232.
30. Wolinsky JS (1993) Multiple sclerosis. In *Current Neurology, Volume 13*, SH Appel, ed, Mosby-Year Book, Inc, Chicago pp 167-207.
31. Wolinsky JS (1994) Rubella virus. In *Encyclopedia of Virology*, RG Webster, A Granoff eds, WB Saunders Co, Orlando,

pp 1291-1298.

32. Wolinsky JS, McCarthy M (1995) Rubella. In *Exotic Viral Infections* JS Porterfield, ed., in Kass Handbook of Infectious Diseases, Chapman & Hall Medical, London, pp 19-45.
33. Wolinsky JS (1996) Mumps virus. In *Virology. Third edition*. Fields BN, Knipe DM, Howley PM, Chanock RM, Melnick JL, Monath TP, Straus SE, eds. Raven Press, New York, pp 1243-1265.
34. Wolinsky JS (1996) Chapter 29: Rubella virus. In *Virology. Third edition*. Fields BN, Knipe DM, Howley PM, Chanock RM, Melnick JL, Monath TP, Straus SE, eds. Raven Press, New York, pp 899-929.
35. Wolinsky JS (1996) Slow virus infections in the nervous system including AIDS. In *Textbook of Internal Medicine, 3rd Edition*, W Kelley, ed, J B Lippincott Co, Philadelphia, pp 2409-2413.
36. Lindsey JW, Brod SA, Wolinsky JS (1997) Multiple sclerosis. In *Current Therapy in Neurologic Disease - 5th Edition*, RT Johnson and JW Griffin eds, Mosby-Year Book, Inc, St. Louis, pp. 178-182.
37. Lindsey JW, Brod SA, Wolinsky JS (1997) Multiple sclerosis. In *Current Therapy in Internal Medicine*, IP Kassirer and HL Greene eds, Mosby-Year Book, Inc., Philadelphia, 1403-1407.
38. Wolinsky JS, Narayana PA, Doyle TJ, Lindsey JW (1997) Pathological mechanisms of demyelination. In *Frontiers in Multiple Sclerosis: Clinical Research and Therapy*, O. Abramsky and A. Ovadia eds., Martin Dunitz Limited, London, 87-95.
39. Lindsey JW, Wolinsky JS (1997) Section 11 Neurology, Chapter IX. Demyelinating disease. In *Scientific American Medicine*, DC Dale and D Federman eds, Scientific American, Inc., New York, 1-11.
40. Frey TK, Wolinsky JS (1998) Rubella virus (Togaviridae). In *Encyclopedia of Virology, 2nd Edition*, RG Webster, A Granoff eds, WB Saunders Co, Orlando, (in press).

#### C. INVITED ARTICLES AND POSITION PAPERS IN JOURNALS

1. Wolinsky JS (1977) Slow virus infections in childhood. *Pediatrics Audio-Digest* 23:6.
2. Wolinsky JS (1977) Brain abscess and subdural empyema. *Neurologic Update* 10.
3. Wolinsky JS (1980) Herpes simplex encephalitis. *The Johns Hopkins Postgraduate Course in Internal Medicine* 8:8.
4. Paty DW, Asbury AK, Herndon RM, McFarland HF, McDonald WI, McIlroy WJ, Prineas JW, Scheinberg LC, Wolinsky JS (1986) Use of magnetic imaging in the diagnosis of multiple sclerosis: Policy statement. *Mag Res Med* 3: ; *Neurology* 36:1575.
5. Wolinsky JS (1991) Cyclosporine and multiple sclerosis - Reply. *Ann Neurol* 29:226.
6. Wolinsky JS, Narayana PA (1991) Proton magnetic resonance spectroscopy and multiple sclerosis. *Lancet* 337:362.
7. Whitaker JN, The Advisory Committee on Clinical Trials of New Agents in Multiple Sclerosis of the National Multiple Sclerosis Society (1993) Expanded clinical trials of treatments for multiple sclerosis. *Neurology* 34:755-766.
8. Frey T, Tingle A, Mitchell LA, Best JM, Schalasta G, Katow S, Wolinsky JS, Gillam S, Atkins GJ, Chantler J, Nakhasi HL (1994) Report of an International Meeting on Rubella Vaccines and Vaccination, 9 August 1993, Glasgow, United Kingdom. *J Infect Dis.* 170:507-509.

9. Wolinsky, JS (1995) Copolymer 1: A most reasonable alternative therapy for early relapsing-remitting multiple sclerosis with mild disability. *Neurology* 45:1245-1247.
10. Lublin FD, Reingold SC, for the National Multiple Sclerosis Society (USA) Advisory Committee on Clinical Trials of New Agents in Multiple Sclerosis (1996) Defining the course of multiple sclerosis: Results of an international survey. *Neurology* 46:907-911.
11. Cornblath, DR and the Therapeutics and Technology Subcommittee Panel (1996) Assessment of plasmapheresis. *Neurology* 47:840-843.
12. Brod SA, Lindsey JW, *Wolinsky JS* (1996) Multiple sclerosis: Pathogenesis and immunotherapy. *Amer Family Physician* 54:1301-1311.
13. Lublin FD, Reingold SC, and the National Multiple Sclerosis Society (USA) Advisory Committee on Clinical Trials of New Agents in Multiple Sclerosis (1997) Guidelines for clinical trials of new therapeutic agents in multiple sclerosis: Relations between study investigators, advisors and sponsors. *Neurology* 48:572-574.
14. Schapiro RT, Scheinberg L, Weiner HL, *Wolinsky JS* (1997) Improving the lives of patients with MS. *Patient Care* 31:87-113.
15. Filippi M, Horsfield MA, Ader HJ, Barkhof F, Bruzzi P, Evans A, Frank JA, Grossman RI, McFarland HF, Molyneux P, Paty DW, Simon J, Tofts PS, *Wolinsky JS*, Miller DH (1998) Guidelines for using quantitative measures of brain magnetic resonance imaging abnormalities in monitoring the treatment of multiple sclerosis. *Ann Neurol* 43:499-506.
16. Arnold DL, *Wolinsky JS*, Matthews PM, Falini A (1998) The use of magnetic resonance spectroscopy in the evaluation of the natural history of MS. *J Neurol Neurosurg Psych* 64:S1, 94-101.
17. Matthews PM, DeStefano N, Narayanan, Francis GS, *Wolinsky JS*, Antel JP, Arnold DL (1998) Putting MRS studies in context: Axonal damage and disability in multiple sclerosis. *Seminars Neurol* (in press).

#### D. ABSTRACTS

1. *Wolinsky JS*, Barnes BD, Margolis MT (1972) Experience with the spinal infusion test in suspected normal pressure hydrocephalus. *Neurology* 22:402.
2. Townsend JJ, *Wolinsky JS*, Baringer JR, Johnson PC (1974) Acquired toxoplasmosis: A neglected cause of treatable nervous system disease. *Neurol* 24:281.
3. *Wolinsky JS*, Baringer JR, Margolis G, Kilham L (1975) The ultrastructure of acute mumps encephalitis in hamsters. *J Neuropath Exp Neurol* 34:80.
4. Goldstein GW, *Wolinsky JS*, Diamond I (1975) Glucose transport in isolated brain capillaries. *Neurol* 25:358.
5. *Wolinsky JS*, Klassen T, Baringer JR (1976) Encephalitis in newborn hamsters after parenteral injection of mumps virus. *J Neuropath Exp Neurol* 35:94.
6. *Wolinsky JS*, Gilden DH, Rorke LB (1976) Parainfluenza I (6/94) virus in newborn mice: Ultrastructural studies. *J Neuropath Exp Neurol* 35:99.
7. Townsend JJ, Baringer JR, *Wolinsky JS* (1976) The neuropathology of progressive rubella panencephalitis. *J Neuropath Exp Neurol* 35:94.



8. Wolinsky JS, Johnson KP, Rand K, Merigan TC (1976) Progressive multifocal leukoencephalopathy: Clinical pathological correlates and failure of a drug trial in two patients. Arch Neurol 33:386, Trans Amer Neurol Assoc 101:81-82.
9. Wolinsky JS, Baringer JR, Burton RA (1976) Measles encephalitis in a compromised host. J Neuropath Exp Neurol 35:339.
10. Wolinsky JS (1977) Mumps virus induced hydrocephalus in hamsters: Ultrastructure of chronic infection. J Neuropath Exp Neurol 36:630.
11. Penney IB, Wolinsky JS (1978) Neuronal and oligodendroglia infection by the WW strain of Theiler's virus. Neurology 28:370.
12. Wolinsky JS, Dau PC, Buimovici-Klein E, Berg BO, Mednick JP (1978) Immunologic studies and failure of a drug trial in patients with progressive rubella panencephalitis. Neurology 28:411.
13. Wolinsky JS, Goldstein G, Csejter J, Backer B (1978) Isolated murine cerebral capillaries accumulate horseradish peroxidase by endocytosis. J Neuropath Exp Neurol 37:709.
14. Parhad II, Johnson KP, Wolinsky JS (1978) Measles and SSPE retinitis and retinal lesions. J Neuropath Exp Neurol 37:670.
15. Parhad IM, Johnson KP, Wolinsky JS, Swoveland P (1979) Experimental measles encephalitis in hamsters: Transmission of virus from periphery to the central nervous system (CNS). Neurology 29:554-555.
16. Wolinsky JS, Lubelt B, Narayan O (1980) Hematogenous origin of inflammatory and microglial rod cells in mice infected with human type 2 poliovirus. Neurology 30:425-426.
17. Coyle PK, Wolinsky JS, Griffin DE, Char DH (1980) Circulating immune complexes in progressive rubella panencephalitis contain anti-rubella IgG. Neurology 30:427.
18. Coyle PK, Brooks B, Hirsch RL, Wolinsky JS, Johnson RT, O'Donnell P, Cohen S (1980) CSF Fc (IgG) receptor bearing lymphocytes are decreased and immune complexes appear in CSF during multiple sclerosis exacerbations. Neurology 30:447.
19. Seay AR, Wolinsky JS, Johnson RT (1980) Primary CNS demyelination in Ross River Virus encephalitis. Ann Neurol 8:113; Trans Amer Neurol Assoc 105:305-307.
20. Coyle PK, Wolinsky JS, Buimovici-Klein K, Moncha R, Cooper LZ (1981) Rubella specific immune complexes following congenital infection and live virus vaccination. Neurology 31(2):126.
21. Seay AR, Wolinsky JS, Johnson RT (1981) Ross River virus-induced demyelination: Ultrastructure of acute lesions. J Neuropath Exp Neurol 40:346.
22. Hanley DF, Wolinsky JS (1981) Herpes virus encephalitis in the severely immunocompromised patient Ann Neurol 10:98; Trans Amer Neurol Assoc 106:288-291.
23. Johnson RT, Hirsch RL, Griffin DE, Wolinsky JS, Rodenbeck S, deSoriano IL, Vaisberg A (1981) Clinical and immunological studies of measles encephalitis. Ann Neurol 10:74; Trans Amer Neurol Assoc 106:42-45.
24. Hilt DC, Buchholz D, Krumholz A, Weiss H, Gale A, Wolinsky JS (1982) Post zoster ophthalmicus cerebral angiitis and contralateral hemiparesis: Diagnosis and treatment. Neurol 32(2):198.

25. Gendelman HE, *Wolinsky JS*, Johnson RT, Pezeshkpour GH (1983) Measles encephalitis: Lack of evidence for viral invasion of the CNS and quantitative study on the nature of demyelination. *Neurol* 33(2):202.
26. Gendelman HE, Pezeshkpour GH, *Wolinsky JS*, Johnson RT, Quarles RH, Doberson MJ (1984) A quantitation of myelin-associated glycoprotein and myelin basic protein in different demyelinating diseases. *Neurology* 34(2):257.
27. McKhann GM, Guillain-Barre Study Group (1985) Plasmapheresis and acute Guillain-Barre syndrome. *Neurology* 35(2):147.
28. *Wolinsky JS*, Waxham MN, Server AC (1985) Protective effects of glycoprotein specific monoclonal antibodies on the course of experimental mumps meningoencephalitis. *Neurology* 35(2):281.
29. *Wolinsky JS*, Waxham MN (1985) Detailed immunochemical analysis of the structural polypeptides of rubella virus. *Neurology* 35(2):282.
30. Server AC, Smith JA, Waxham MN, *Wolinsky JS*, Goodman HM (1985) Comparison of the F<sub>1</sub> HN<sub>2</sub>-terminal region of a fusing and a non-fusing strain of mumps virus. *Virus Research* 15:72.
31. *Wolinsky JS*, Narayana PA, Jensen DJ, DeLayre JL (1986) Magnetic resonance imaging of experimental mumps meningoencephalitis. *Neurology* 36(2):164.
32. Kerman RH, *Wolinsky JS*, Nelson FW, Sears Jr ES (1986) Serial immune evaluation of chronic progressive multiple sclerosis patients. *Ann Neurol* 20:166.
33. McKhann GM, Griffin JW, Cornblath DR, Fisher RS, Quaskey SA, Mellits ED and the GBS Study Group (1987) Plasmapheresis and the Guillain-Barre syndrome: I. Factors associated with outcome. *Neurology* 37(2):252.
34. Cornblath DR, Griffin JW, Fisher RS, McKhann GM, Quaskey SA, Mellits ED and the GBS Study Group (1987) Plasmapheresis and the Guillain-Barre syndrome: II. Analysis of electrodiagnostic data. *Neurology* 37(2):252.
35. Kerman RH, *Wolinsky JS*, Nath A, Sears Jr ES, Franklin GM, Nelson LM (1987) Immunoregulation in MS patients treated with cyclosporine. *Ann Neurol* 22:154; *J Neuroimmunol* 16:90-91.
36. Rammohan KW, *Wolinsky JS*, Omerza J, Gales T, Kissel J, Mendell J (1988) Mumps virus in IBM: Studies implicating cross-reactivity accounting for antigen localization. *Neurology* 38(S1):151.
37. Nath A, Kerman RH, *Wolinsky JS* (1988) Effect of cyclosporine on rubella-specific immune responses in chronic progressive multiple sclerosis. *Neurology* 38(S1):195.
38. The Multiple Sclerosis Study Group (1988) Measuring disease status in chronic progressive multiple sclerosis: Should a unified rating scale be used. *Ann Neurol* 24:144.
39. The Multiple Sclerosis Study Group (1988) The efficacy of cyclosporine immunosuppression in MS: A preliminary report of a randomized, blinded, placebo controlled, clinical trial. *Ann Neurol* 24:169.
40. The Multiple Sclerosis Study Group (1988) The toxicity of cyclosporine immunosuppression in MS: Preliminary analysis of a randomized, blinded, placebo controlled, clinical trial. *Ann Neurol* 24:169.
41. *Wolinsky JS*, Narayana PA, Fenstermacher MJ (1989) Magnetic resonance (MR) spectroscopy in multiple sclerosis (MS). *Neurology* 39(S1):383.
42. Nath A, Kerman RH, Novak IS, *Wolinsky JS* (1989) Immune responses in a patient with HIV infection and myasthenia

gravis (MG). *Neurology* 39(S1):331.

43. Narayana PA, *Wolinsky JS*, Jackson EF, McCarthy M (1991) Magnetic resonance of multiple sclerosis: Correlation between proton spectroscopy and GdDTPA enhancement. *SMRM*:82.
44. *Wolinsky JS*, Narayana PA, Jackson EF, McCarthy M (1991) Localized proton magnetic resonance spectroscopy (MRS) in multiple sclerosis (MS): Correlation with gadolinium-DTPA enhanced MRI. *Neurology* 41(S1):169.
45. Narayana PA, *Wolinsky JS*, Jackson EF, McCarthy M (1991) Proton MR spectroscopy of gadopentetate dimeglumine-enhanced multiple sclerosis lesions. *JMRI*:156.
46. *Wolinsky JS*, Jin R (1991) Allelic variation in exon IV of the proteolipid protein gene: No relationship to multiple sclerosis. *Ann Neurol* 30:234-235.
47. Williams LL, Jin R, Singley CT, Shannon BT, Chang LS, Pelok S, Davidorf FH, *Wolinsky JS* (1991) Persistent rubella virus infection reduces essential phagocytic activity of cultured human retinal pigment epithelial cells. *Ann Neurol* 30:310.
48. Lovett A, McCarthy M, Frey T, Rice C, *Wolinsky JS* (1992) Rubella-specific cytotoxic T-cell responses. *FASEB J* 6:A1334.
49. Jackson EF, Narayana PA, *Wolinsky JS*, Falconer JC (1992) Volumetric analysis of multiple sclerosis lesions with and without enhancement. *SMRI*:53.
50. Jackson EF, Narayana PA, *Wolinsky JS* (1992) Short echo time <sup>1</sup>H spectroscopic imaging of multiple sclerosis and normal brain. *SMRI*:515.
51. *Wolinsky JS*, McCarthy M (1993) Immune responses to rubella virus (RV) are altered in multiple sclerosis (MS) patients. *Neurology* 43(S2):A162.
52. Doyle T, Narayana P, Jackson E, *Wolinsky J* (1993) Longitudinal, short echo time proton spectroscopic imaging of MS. *SMRM*:1551.
53. Narayana P, *Wolinsky JS*, Doyle T, Dimachkie, MM (1994) Serial two-dimensional proton magnetic resonance spectroscopic imaging and GdDTPA enhanced MRI in MS. *SMR* (in press).
54. Brod SA, Khan M, Bright J, Sriram S, Marshall Jr. GD, *Wolinsky JS* (1995) Decreased CD3-mediated interferon-gamma production in relapsing-remitting multiple sclerosis. *Neurology* 45:A164.
54. *Wolinsky JS*, Narayana PA, Doyle TJ, Lindsey JW (1995) Serial 2-D proton magnetic resonance spectroscopic imaging (MRSI) of multiple sclerosis (MS). *Neurology* 45:A282.
55. Narayana PA, *Wolinsky JS*, Doyle TJ, Lindsey JW (1995) Serial proton magnetic resonance spectroscopic imaging in multiple sclerosis. *RSNA* (submitted).
56. Johnson, KP, The Phase III Copolymer 1 Study Group, Tetelbaum D, Arnon R, Sela M (1995) Antibodies to copolymer 1 do not interfere with its clinical effect. *Ann Neurol* 38:973.
57. Johnson, KP, The Phase III Copolymer 1 Study Group. (1995) Copolymer 1: Multi-center multiple sclerosis trial extension shows improved effects on relapse rate and disability. *Ann Neurol* 38:971-972.
54. *Wolinsky JS*, Narayana PA, Doyle TJ, Lindsey JW (1995) Pathological mechanisms of demyelination: As gleaned by serial proton magnetic resonance spectroscopic imaging of multiple sclerosis. *J Neuroimmunol Suppl* 2:A7.

55. Marshall GD, Khan M, Henninger EM, Kerman RH, *Wolinsky JS*, Brod SA (1996). IFN $\beta$ -1b treatment of relapsing-remitting multiple sclerosis decreases CD3-mediated TNF $\alpha$  and increases CD3-mediated IL-6 production in vitro. *Neurology* 46:A36.
56. Johnson KP and The Copolymer 1 Multiple Sclerosis Study Group (1996) Extended report of the positive phase III trial of copolymer 1 for the treatment of relapsing remitting multiple sclerosis. *Neurology* 46:A406.
57. Brod SA, Marshall Jr. GD, Henninger EM, Nelson L, Khan M, *Wolinsky JS* (1996) Ingested IFN $\alpha$  has biological effects in humans. *Neurology* 46:A407.
58. Bedell BJ, Narayana PA, *Wolinsky JS* (1996) Segmentation of MRI-defined multiple sclerosis lesions using FLAIR-MTC and MR flow images. *Neurology* 46:A481.
59. Brod SA, Nelson L, *Wolinsky JS* (1996) Ingested IFN $\alpha$  has biological effects in humans. *FASEB J* 10: A1029.
60. Brod SA, Nelson L, Khan M, *Wolinsky JS* (1997) Increased CD4+ and CD8+ T cell IFN $\gamma$  and CD4+ T cell IL-10 production in relapsing-remitting multiple sclerosis. *Neurology* 48:A59.
61. *Wolinsky JS*, Narayana PA, and the MRI-AC (Houston, TX) for the North American Linomide Trialists (1997) Pre-randomization characteristics of relapsing and secondary progressive multiple sclerosis subjects evaluated for the North American Linomide Trial by automated quantitative MRI. *Ann Neurology* 42:A458-459.
62. Johnson KP and The Copolymer 1 Multiple Sclerosis Study Group (1998) Efficacy of glatiramer acetate (Copaxone) on multiple sclerosis disability is confirmed by analysis with the integrated disability status scale (IDSS). *Neurology* 50:A62-A63.
63. *Wolinsky JS*, Narayana PA, the MRI-AC (Houston, TX), the North American Linomide Trialists (1998) Phase III North American Linomide trial of roquinimex (Linomide) in relapsing-remitting (RR) and secondary progressive (SP) multiple sclerosis (MS): MRI findings. *Neurology* 50:A62.
64. Noseworthy JH, *Wolinsky JS*, Lublin FD, Whitaker JN, Linde A, Gjorstrup P, Sullivan HC, and the North American Linomide Trialists (1998) Phase III North American Linomide trial of roquinimex (Linomide) in relapsing-remitting (RR) and secondary progressive (SP) multiple sclerosis (MS): Clinical results. *Neurology* 50:A62.

#### E. OTHER PROFESSIONAL COMMUNICATIONS

1. *Wolinsky JS*, Gilden D (1975) Studies of parainfluenza I (6/94) virus in vivo. Federation of Western Societies of Neurological Sciences, San Diego.
2. Townsend J, Baringer J, *Wolinsky JS*, Malamud N, Mednick J, Panitch H, Scott R, Oshiro L, Cremer N (1975) Progressive rubella encephalitis: Late onset after congenital rubella. Federation of Western Societies of Neurological Sciences, San Diego.
3. Goldstein GW, *Wolinsky JS*, Diamond I (1975) Isolation of metabolically active capillaries from cat brain. American Society for Neurochemistry, Mexico City.
4. Goldstein GW, *Wolinsky JS*, Diamond I (1975) Metabolic activity of isolated brain capillaries. Society for Pediatric Research, Denver.
5. *Wolinsky JS* (1976) Viral persistence in neural tissues. Winter Conference on Brain Research, Keystone.
6. *Wolinsky JS* (1976) Rubella virus infection in the nervous system. Basil O'Connor Starter Research Grant Colloquium,

Boston.

7. Stroop WG, *Wolinsky JS*, Penney JB (1979) Polypeptides of the WW strain of Theiler's murine encephalitis virus. Amer Soc Microbiol, Los Angeles.
8. Merz DC, *Wolinsky JS* (1981) Enzyme parameters for mumps virus neuraminidases: Correlation with cytopathogenicity. Amer Soc Microbiol, Dallas.
9. Server AC, Merz DC, Waxham MN, *Wolinsky JS* (1981) Characterization of mumps virus hemagglutinin-neuraminidase (HN) glycoprotein with monoclonal antibody. Amer Soc Microbiol, Dallas.
10. *Wolinsky JS*, Waxham MN, Hess J, Townsend JJ, Baringer JR (1981) Progressive rubella panencephalitis: Immunochemical features. Fifth Intl Cong Virol, Strasbourg.
11. Narayan O, *Wolinsky JS*, Clements IE (1981) Macrophages are preferentially infected during slow infections of sheep and goats by visna like viruses. Fifth Intl Cong Virol, Strasbourg.
12. Schwendemann G, *Wolinsky JS*, Merz DC, Hatzidimitriou G (1981) Immunocytochemischer nachweis von virus antigen in ZNS nach kunstharzeinbettung. Licht und electronen mikroskopische untersuchungen bei paramyxovirus infektionen. Duetschen gesellschaft Neuropath Neuroanat, Freiburg, Germany.
13. *Wolinsky JS* (1982) Slow virus infection by conventional agents. Ninth Annual Symposium, Barrow Neurological Institute, Scottsdale.
14. *Wolinsky JS* (1982) Scientific overview of inflammatory demyelinating polyneuropathy and current status of the NIH-Johns Hopkins Collaborative Study of plasma exchange in Guillain-Barre syndrome. Third National Conference on Therapeutic Apheresis, Dallas.
15. *Wolinsky JS* (1982) The possible role of viruses in the etiology of multiple sclerosis. Multiple Sclerosis: Management and Clues to Its Etiology. Memphis.
16. Schwendemann G, *Wolinsky JS*, Hatzidimitriou G, Merz D, Waxham MN (1982) Post-embedding immunocytochemical staining of paramyxovirus antigens in CNS for light and electron microscopy. IXth International Congress Neuropathology, Vienna.
17. *Wolinsky JS* (1983) Entry of macrophages and lymphocytes into the nervous system. Neurodegenerative Disorders of Childhood: Pathogenesis, Counseling, and Therapy. Baltimore.
18. Merz DC, *Wolinsky JS* (1983) Conversion of nonfusing mumps virus infections to fusing infections by exogenous protease. American Society Microbiology, New Orleans.
19. *Wolinsky JS*, Waxham MN, Server AC, Merz DC (1983) Treatment of experimental mumps meningoencephalitis using monoclonal antibodies. Negative Strand Virology Meetings, Hilton Head.
20. *Wolinsky JS* (1984) The Neurobiology of Alzheimer's Disease. UT/TV Medical Update, Houston.
21. *Wolinsky JS*, Waxham MN (1984) Immunologic characterization of rubella virus. Fogarty International Symposium on The Prevention of Congenital Rubella Infection, Washington, DC.
22. *Wolinsky JS* (1985) Diagnosis and ICU management of encephalitis. American Academy of Neurology, Dallas.
23. Waxham MN, *Wolinsky JS* (1985) A fusing mumps virus variant selected from a non-fusing parent with the

neuraminidase inhibitor 2-deoxy-2,3-dehydro-N-acetylneuraminic acid. American Society for Virology, Albuquerque.

24. *Wolinsky JS* (1985) Progressive rubella panencephalitis, characterization of rubella virus polypeptides and biological implications. Georg-August-Universitat Gottingen, West Germany .

25. *Wolinsky JS* (1986) Rubella virus and its neurologic complications. University of Minnesota, Minneapolis.

26. *Wolinsky JS* (1986) Rubella virus and central nervous system disease. Baylor College of Medicine, Houston.

27. *Wolinsky JS* (1986) Experimental mumps meningoencephalitis as a model for acute viral illness. Texas Medical Association 119th Annual Session, Dallas.

27. *Wolinsky JS* (1986) Clinical update on acute Guillain-Barre Syndrome. Texas Medical Association 119th Annual Session, Dallas.

28. *Wolinsky JS* (1986) Rubella virus and its effects on the developing central nervous system. Princess Marie-Christine Foundation for Pediatric Research, International Symposium on Viral Infections and the Developing Nervous System. Brussels.

29. *Wolinsky JS* (1987) Rubella and the CNS. Glaxo Pharmaceutical Seminar in Infectious Disease, The University of Texas Medical School, Houston.

30. *Wolinsky JS* (1987) Plasma exchange in Guillain-Barre syndrome. Gulf Coast Regional Blood Center, Current Topics in Apheresis, Houston.

31. *Wolinsky JS* (1988) Immunopharmacology of cyclosporine therapy and its application to neurological disease. American Academy of Neurology, Cincinnati.

32. *Wolinsky JS* (1988) Teratogenic and delayed consequences of maternal rubella. Behavioral Teratology Society, Palm Beach Teratology 37:516.

33. *Wolinsky JS* (1988) Issues in the choice of immunotherapy for multiple sclerosis: When not to treat and what not to use. 113th Annual Meeting of the American Neurological Association, Philadelphia.

34. *Wolinsky JS*, Kerman RH, Nath A, Franklin GM, Nelson LM, Sears Jr. ES (1988) Cyclosporine modulation of immune abnormalities in chronic progressive multiple sclerosis. International Workshop Diagnostic and Therapeutic Trials in Multiple Sclerosis: A New Look. Jekyll Island, Ga.

33. *Wolinsky JS* (1988) Subacute sclerosing panencephalitis, progressive rubella panencephalitis and progressive multifocal leukoencephalopathy. Annual Meeting, Association for Research in Nervous and Mental Diseases; Immunologic Mechanisms in Neurologic and Psychiatric Disease. New York (Arch Neurol 45:1282A, 1988).

34. *Wolinsky JS* (1989) Possible mechanisms and treatments of multiple sclerosis. The University of Colorado School of Medicine, Denver.

35. *Wolinsky JS* (1989) Multiple sclerosis - Clinical aspects and Multiple sclerosis - Basic aspects. Twenty-second Annual Recent Advances in Neurology, The University of California School of Medicine San Francisco, San Francisco.

36. *Wolinsky JS* (1989) Multiple sclerosis. Advances in Clinical Neuroimmunology: Basic Principles and Guidelines for Management. The University of Alabama School of Medicine, Birmingham.

37. *Wolinsky JS* (1989) Experimental therapy in multiple sclerosis. Issues Seminar, National Multiple Sclerosis Society,

Chicago.

38. *Wolinsky JS* (1989) Multiple sclerosis - an update. The University of Oregon Health Science Center, Portland.
39. *Wolinsky JS* (1989) Multiple sclerosis - an update. The University of Washington School of Medicine, Seattle.
40. *Wolinsky JS* (1989) Possible mechanisms and treatments of multiple sclerosis. The University of Texas Medical Branch, Galveston.
41. Narayana PA, *Wolinsky JS*, Fenstermacher MJ (1989) Proton magnetic resonance spectroscopy in multiple sclerosis. Society of Magnetic Resonance in Medicine, Amsterdam.
42. *Wolinsky JS*, Allen-Cannady O, Simmons D (1989) A monoclonal antibody defined epitope map of expressed rubella virus protein domains. Second International Symposium on Positive Strand RNA Viruses, Vienna.
43. *Wolinsky JS* (1989) MR spectroscopy in multiple sclerosis. Multiple Sclerosis Update '89, Houston.
44. *Wolinsky JS* (1989) Immunoregulation in multiple sclerosis. The University of Iowa, Iowa City.
45. *Wolinsky JS* (1989) Treatment advances in multiple sclerosis. Treatment Advances in Neurologic Disease and Stroke. 10<sup>th</sup> Annual Army Medical Department Neurology (AMEDD) Conference, San Antonio.
46. *Wolinsky JS* (1989) Cyclosporine: Its effects on the immune system, and Cyclosporine and multiple sclerosis. Recent Advances in the Therapy of Autoimmune Diseases The Cleveland Clinic Foundation, Cleveland.
47. *Wolinsky JS* (1989) Recent advances in multiple sclerosis. Multiple Sclerosis and Myasthenia Gravis: New Treatment Options. The University of Arizona College of Medicine Continuing Medical Education Symposium, Tempe.
48. *Wolinsky JS* (1990) The use of cyclosporine and multiple sclerosis. The University of Utah, Salt Lake City.
49. Karounos DG, *Wolinsky JS*, Thomas JW (1990) Autoantibodies to 52kDa islet proteins: A disease and tissue-specific marker for insulin-dependent diabetes mellitus. American Federation for Clinical Research, Washington, DC.
50. Karounos DG, *Wolinsky JS*, Gillard BK, Thomas JW (1990) Molecular mimicry in type I diabetes: An antigenic determinant on a rubella virus protein is shared with a 52 kD beta cell autoantigen. American Diabetes Association, Atlanta.
51. *Wolinsky JS* (1990) Therapy advances in multiple sclerosis. The University of South Alabama, Mobile.
52. *Wolinsky JS*, Allen-Cannady O, Simmons D, Jin R, Cao S-N (1990) Monoclonal antibody defined "linear" epitopes map to expressed rubella virus protein domains. American Society for Virology, Salt Lake City.
53. Lovett A, McCarthy M, Kerman RH, *Wolinsky JS* (1990) Mapping of cell-mediated immunodominant domains with expressed rubella virus proteins. American Society for Virology, Salt Lake City.
54. McCarthy M, Kerman RH, *Wolinsky JS* (1990) An immunodominant domain within the rubella virus capsid protein contains T-cell and B-cell determinants. American Society for Virology, Salt Lake City.
55. *Wolinsky JS* (1990) Rubella Update. Merck Sharp and Dohme, Blue Bell, PA.
56. *Wolinsky JS* (1990) Multiple sclerosis: Current status of therapy. Clinical Neuroimmunology Symposium. The Neuroimmunology Institute of Dallas, Dallas.

57. *Wolinsky JS* (1990) Autoimmune pathogenesis and treatment of multiple sclerosis. The New York Hospital-Cornell Medical Center, New York.
58. *Wolinsky JS* (1990) Immunotherapy of multiple sclerosis, and Rubella virus and molecular mimicry. The Columbia-Presbyterian Medical Center, New York.
59. *Wolinsky JS* (1990) Rubella - Update for the 1990's. The National Institutes of Health, Bethesda.
60. *Wolinsky JS* (1990) Immune regulation in multiple sclerosis. Louisiana State University Medical Center, New Orleans.
61. *Wolinsky JS* (1990) Progressive multifocal leukoencephalopathy and subacute sclerosing panencephalitis; Progressive rubella panencephalitis and molecular mimicry In, Pathogenesis of Neuroimmunologic Disease Marine Biological Laboratory, Woods Hole.
62. *Wolinsky JS* (1990) Immunologic aspects of multiple sclerosis. Current Concepts and Future Trends in Neuroimmunology II. The University of South Florida Continuing Education Program, Tampa.
63. *Wolinsky JS* (1990) Epitope mapping of rubella virus: Relationship to understanding rubella as a disease. Texas A&M University, College Station.
64. *Wolinsky JS* (1990) Multiple sclerosis: Contemporary therapy. 2nd Clinical Neuroimmunology Symposium. The University of Maryland Continuing Education Program, Baltimore.
65. *Wolinsky JS* (1990) Current issues in multiple sclerosis. The University of Pennsylvania Medical Center, Philadelphia.
66. *Wolinsky JS* (1990) Recent advances in the therapy of autoimmune diseases. Jefferson Medical College, Philadelphia.
67. *Wolinsky JS* (1991) Rubella and molecular mimicry. Baylor College of Medicine, Houston.
68. *Wolinsky JS* (1991) Epitope mapping of rubella virus: Potential for synthetic peptides in rapid serodiagnosis. Carter-Wallace, Inc, Wampole Laboratories, Canbury, NJ.
69. *Wolinsky JS*, Narayana PA, Jackson EF, McCarthy M (1991) Localized proton magnetic resonance spectroscopy (MRS) in multiple sclerosis (MS): Correlation with gadolinium-DTPA enhanced MRI. American Academy of Neurology, Boston.
70. Narayana PA, *Wolinsky JS*, Jackson EF, McCarthy M (1991) Proton MRS of GdDTPA enhanced multiple sclerosis lesions. Soc Magn Res Imaging, San Francisco.
71. McCarthy M, Kerman RH, Lovett A, *Wolinsky JS* (1991) Proximity of T-cell and B-cell determinants within rubella virus structural proteins. American Society for Virology, Fort Collins.
72. *Wolinsky JS*, Sukholutsky E, Moore WT, Adame B, Allen-Cannady O (1991) Epitopes of two neutralizing rubella virus monoclonal antibodies are defined by an immunogenic synthetic peptide. American Society for Virology, Fort Collins.
73. *Wolinsky JS*, Jin R (1991) Allelic variation in exon IV of the proteolipid protein gene: No relationship to multiple sclerosis. 116th Annual Meeting of the American Neurological Association, Seattle.
74. Williams LL, Jin R, Singley CT, Shannon BT, Chang LS, Pelok S, Davidorf FH, *Wolinsky JS* (1991) Persistent rubella virus infection reduces essential phagocytic activity of cultured human retinal pigment epithelial cells. 116th Annual Meeting of the American Neurological Association, Seattle.
75. Moore WT, *Wolinsky JS*, Suter MJ-F, Farmer TB, Caprioli RM (1991) Immunogenic synthetic peptide epitope mapping



with structural validation using electrospray mass spectrometry. Fifth Symposium of the Protein Society, Baltimore.

76. *Wolinsky JS* (1991) Rubella virus and late complications of early infections. Hilton-Perkins Symposium on the Long Term Effects of Congenital Rubella Syndrome. Newton, MA.
77. *Wolinsky JS* (1991) Progressive multifocal leukoencephalopathy and subacute sclerosing panencephalitis; Progressive rubella panencephalitis and molecular mimicry In, Pathogenesis of Neuroimmunologic Disease. Marine Biological Laboratory, Woods Hole.
78. *Wolinsky JS* (1991) The use of MRI as an outcome measure in multiple sclerosis. In, First Annual Brook Lodge Clinical Trials Conference Topic: Neurodegenerative Diseases. Kalamazoo, MI.
79. Lovett A, McCarthy M, Frey T, Rice C, *Wolinsky JS* (1992) Rubella-specific cytotoxic T-cell responses. FASEB, Anaheim.
80. *Wolinsky JS* (1992) The use corticosteroids in the treatment of home patients with multiple sclerosis. Critical Care America, Houston.
81. *Wolinsky JS* (1992) Immunosuppressive therapy in multiple sclerosis. In, Immunosuppressive Treatment for Neurologists, Continuing Education Courses of the American Academy of Neurology. San Diego.
82. *Wolinsky JS* (1992) Current research and the future of clinical trials in multiple sclerosis. Keynote speaker - National Leadership Conference of the National Multiple Sclerosis Society, Baltimore.
83. Lovett A, McCarthy M, Frey T, Rice C, *Wolinsky JS* (1992) Identification of a rubella capsid-specific cytotoxic T-cell responses. American Society for Virology, Ithaca.
84. McCarthy M, Lovett A, Overstreet A, *Wolinsky JS* (1992) Proximity of T- and B-cell determinants within rubella virus E2 glycoprotein. American Society for Virology, Ithaca.
85. *Wolinsky JS*, Sukholutsky E, Jin R, Moore WT (1992) Epitopes of rubella virus E2 glycoprotein-specific monoclonal antibodies defined by synthetic peptides. American Society for Virology, Ithaca.
86. *Wolinsky JS*, Moore WT, Sukholutsky E, McCarthy M, Lovett A (1992) Antibodies and synthetic peptides define a neutralization domain within the E1 glycoprotein of rubella virus. Third International Positive Strand Symposium. Clearwater, FL.
87. *Wolinsky JS* (1992) Current and future clinical trials in multiple sclerosis. North Texas Chapter Annual Meeting of the National Multiple Sclerosis Society, Dallas.
88. *Wolinsky JS* (1992) The use of MRI as an outcome measure for lazeroid trials in multiple sclerosis. Kalamazoo, MI.
89. *Wolinsky JS* (1993) The immunopathogenesis and treatment of multiple sclerosis. In, Pathogenesis and Treatment of Immune-related Neuromuscular and Demyelinating Diseases: Role of IVIG. New York.
90. *Wolinsky JS* (1993) Treatment of multiple sclerosis: Current treatment and therapeutic trials. In, Immunosuppressive Treatment for Neurologists, Continuing Education Courses of the American Academy of Neurology. New York.
90. *Wolinsky JS* (1993) Use of magnetic resonance spectroscopy. In, National Multiple Sclerosis Society Annual Issues Forum - New Perspectives on the Use of Magnetic Resonance in MS: Diagnosis, Pathology and Therapeutics. New York.
91. *Wolinsky JS* (1993) Herpes simplex encephalitis. In, Infections of the Nervous System, Continuing Education Courses of the American Academy of Neurology. New York.

92. *Wolinsky JS* (1993) Herpes simplex and other viral encephalitis. In, Section on Neurology, 126th Annual Session, Texas Medical Association, Houston.
93. *Wolinsky JS* (1993) Use of magnetic resonance spectroscopy in multiple sclerosis. In, Management Issues in MS: New Approaches to Primary Therapy. The University of Utah. Salt Lake.
94. *Wolinsky JS* (1993) Use of magnetic resonance spectroscopy in multiple sclerosis. In, Management Issues in MS: New Approaches to Primary Therapy. 1993 Symposium, Utah State Chapter National Multiple Sclerosis Society. Salt Lake.
95. Edson SE, Lovett A, Sukholutsky E, *Wolinsky JS* (1993) A synthetic chimeric peptide rapidly induces rubella virus-specific neutralizing antibodies. American Society for Virology, Davis.
96. Pustowoit, B, Sukholutsky E, *Wolinsky JS* (1993) Antipeptide responses as serological markers for acute rubella virus infections. IXth International Congress of Virology [P2-18], Glasgow.
97. *Wolinsky JS*, Sukholutsky E, Lovett A, Edson, SE, Moore WT, (1993) A chimeric peptide rapidly induces rubella virus (RV)-specific neutralizing (NT) antibodies. IXth International Congress of Virology [W2-8], Glasgow.
98. *Wolinsky JS*, (1993) Synthetic subunit rubella vaccines: Fact or fancy? NIH Sponsored Dinner Symposium on Rubella. IXth International Congress of Virology, Glasgow.
99. *Wolinsky JS* (1993) MRI and MRS in demyelinating disease; Progressive multifocal leukoencephalopathy; JC and other viruses; Subacute sclerosing panencephalitis; Progressive rubella panencephalitis and molecular mimicry. all In, Pathogenesis of Neuroimmunologic Diseases. Marine Biological Laboratory, Woods Hole.
100. *Wolinsky JS* (1993) Current application of magnetic resonance spectroscopy to multiple sclerosis. Multiple Sclerosis Update Series 1993, Houston.
101. *Wolinsky JS* (1993) The immunopathogenesis and treatment of multiple sclerosis. In, Immune-Mediated Neurological Diseases, Tempe, AZ.
102. *Wolinsky JS* (1993) Multiple sclerosis update. University of Medicine and Dentistry of New Jersey, Newark.
103. *Wolinsky JS* (1993) Viral expression systems: Sindbis virus. Texas Branch of the American Society for Microbiology, Austin.
104. *Wolinsky JS* (1993) Update on multiple sclerosis. Houston Northwest Medical Center, Houston.
105. *Wolinsky JS* (1994) Magnetic resonance spectroscopy: Status and promise. National Multiple Sclerosis Society, Workshop on Outcomes Assessment in Multiple Sclerosis Treatment Trials. A Critical Analysis. Charleston.
106. *Wolinsky JS* (1994) The use of magnetic resonance imaging and spectroscopy to monitor demyelination in multiple sclerosis. The Gordon Conference on Myelin. Oxnard.
107. *Wolinsky JS* (1994) Contributions of MRI and MRS to understanding multiple sclerosis. The University of Kentucky. Lexington.
108. *Wolinsky JS* (1994) Treatment of multiple sclerosis: Current treatment and therapeutic trials. In, Immunosuppressive Treatment for Neurologists, Continuing Education Courses of the American Academy of Neurology. Washington, D.C.
109. *Wolinsky JS* (1994) Multiple sclerosis - Treatment update, Rubella virus - New challenges, Proton magnetic resonance spectroscopic imaging of multiple sclerosis. all at the University of Manitoba, Winnipeg.

110. *Wolinsky JS* (1994) Multiple sclerosis: Current concepts in treatment. San Diego Neurologic Society, San Diego.
111. *Wolinsky JS* (1994) Magnetic resonance spectroscopy: Status and promise. University of California San Diego, San Diego.
112. *Wolinsky JS* (1994) Current and future role of MRI in multiple sclerosis. Health Science Communications, Inc. CME Program, New York.
113. *Wolinsky JS* (1994) New directions in the management of multiple sclerosis. Neuroscience Speakers Series, Corpus Cristi.
114. *Wolinsky JS* (1994) Serial proton spectroscopic imaging in multiple sclerosis: Current status. Colloque en Faveur de la Recherche sur la Sclérose en Plaques. Association pour le Développement de Nouvelles Thérapeutiques de la Sclérose en Plaques Geneva.
112. *Wolinsky JS* (1994) Contemporary treatment efforts in multiple sclerosis. Symposium on Neurological Therapeutics, American Neurological Association, 119th Annual Meeting, San Francisco.
113. *Wolinsky JS* (1994) Molecular biology of rubella virus: Implications for diagnostics and vaccines. European Congenital Symposium, Paul Ehrlich Institute. Langen, Germany.
114. *Wolinsky JS* (1994) Copolymer 1: Positive results from a phase III trial in relapsing remitting multiple sclerosis. 10th Congress of the European Committee for the Treatment and Research in Multiple Sclerosis. Athens.
115. *Wolinsky JS* (1994) New directions in the management of multiple sclerosis. University of Texas, San Antonio.
116. *Wolinsky JS* (1995) New directions in the management of multiple sclerosis. John Muir Medical Center, Walnut Creek, CA.
117. *Wolinsky JS* (1995) Treatment of multiple sclerosis: Current treatment and therapeutic trials. In, Immunosuppressive Treatment for Neurologists, Continuing Education Courses of the American Academy of Neurology. Seattle.
118. *Wolinsky JS* (1995) Magnetic resonance spectroscopy studies in multiple sclerosis. Mayo Clinic, Rochester.
119. *Wolinsky JS* (1995) Newer therapy in multiple sclerosis. Neurology Update 1995, Houston, TX.
120. *Wolinsky JS* (1995) New directions in the management of multiple sclerosis. Harris Methodist - HEB, Bedford, TX.
121. *Wolinsky JS* (1995) Recent advances in multiple sclerosis. The New York Hospital-Cornell Medical Center, New York.
122. *Wolinsky JS* (1995) New directions in the management of multiple sclerosis. The Eight Annual John H. Kendig Lecture Series. St. John's Mercy Medical Center, St. Louis.
123. *Wolinsky JS* (1995) The use of MRI in clinical trials after the year 2000. In MS: Visions of the Future. Jerusalem.
124. *Wolinsky JS* (1995) Impact of current clinical. Multiple Sclerosis Update 1995, Houston.
125. *Wolinsky JS* (1995) Immunosuppressive and steroid treatment in multiple sclerosis, and Copolymer I: Treatment of relapsing MS, both in Multiple Sclerosis 1995 Clinical and Treatment Issues. The National Multiple Sclerosis Society Massachusetts Chapter, Cambridge, MA.
126. *Wolinsky JS* (1995) Advances in multiple sclerosis treatment. 40th Annual Meeting, The South Texas Chapter of the

National Multiple Sclerosis Society, San Antonio.

127. Narayana PA, Bedell BJ, *Wolinsky JS* (1995) An integrated approach for MRI-observed MS lesion quantitation. *An invited presentation at* Evaluation of Multiple Sclerosis Lesion Load: Comparison of Multiple Imaging Processing Techniques. Montreal.
128. *Wolinsky JS* (1995) Advances in treatment of multiple sclerosis. Clinical Neurology Update 95, San Antonio.
129. *Wolinsky JS* (1995) Update: Older and emerging immunotherapies. Multiple Sclerosis: Clinical Issues and Decisions, Southeastern Regional Conference, Dallas.
130. *Wolinsky JS* (1996) Update: Emerging immunotherapies. Multiple Sclerosis: Clinical Issues and Decisions, Eastern Regional Conference, St. Petersburg.
131. *Wolinsky JS* (1996) The immunopathogenesis and treatment of multiple sclerosis. In Mechanisms and Immunotherapies in Immune-Mediated Neurological and Neuromuscular Diseases. Health Science Communications, Inc. CME Program, San Francisco.
132. *Wolinsky JS* (1996) Treatment of multiple sclerosis: Current treatment and therapeutic trials. In, Immunosuppressive Treatment for Neurologists, Continuing Education Courses of the American Academy of Neurology. San Francisco.
133. *Wolinsky JS* (1996) MRI should be used as the primary outcome measure in MS clinical trials. In, Multiple Sclerosis, Continuing Education Courses of the American Academy of Neurology. San Francisco.
134. *Wolinsky JS* (1996) Panel I: Disease Clusters. Neurological diseases including multiple sclerosis. *at* Unlocking the Mysteries: Autoimmune Disease in Women. PHS Office on Women's Health's Healthy Women 2000. Washington, D. C.
135. *Wolinsky JS* (1996) MRI Data. *at* Clinical Trial on IFNB-1b in Multiple Sclerosis: An overview 3 years after publication. Milan.
136. *Wolinsky JS* (1996) New Techniques Focusing on the Process of Demyelination. *at* Beta Interferon and the Blood Brain Barrier. Keele University, England.
137. *Wolinsky JS* (1996) Update: Emerging immunotherapies. Multiple Sclerosis: Clinical Issues and Decisions, Western Regional Conference, Seattle.
138. *Wolinsky JS* (1996) New directions in the management of multiple sclerosis. Walter Reed Army Medical Center, Washington, D.C.
139. *Wolinsky JS* (1996) Updating on imaging techniques and treatment of MS. Neurologische Universitätsklinik, Zürich.
140. *Wolinsky JS* (1996) Updating on imaging techniques and treatment of MS. Max Planck Institut, München.
141. *Wolinsky JS* (1996) Treatment of multiple sclerosis with copolymer 1. In *Multiple Sklerose: Neue konzepte und therapeutische alternativen*. Museum Kortumstrasse, Bochum, Germany.
141. *Wolinsky JS* (1996) Basic principles and applications, and MRI: Future developments. In *MRI in MS: Clinical implications and applications*, Consortium of Multiple Sclerosis Clinics, Atlanta.

142. *Wolinsky JS* (1996) Multiple sclerosis: Current usage and therapeutic trials of agents for patients with multiple sclerosis. In *Presidential Symposium: Multiple sclerosis: Current knowledge and its applications to patients*, 121<sup>st</sup> Annual Meeting, American Neurological Association, Miami.
143. *Wolinsky JS* and *Narayana PA* (1997) Natural history of MS seen with magnetic resonance spectroscopy. In *Workshop on the Role of Magnetic Resonance Techniques in Understanding and Managing Multiple Sclerosis*, Oxford.
144. *Wolinsky JS* (1997) The US experience of copolymer 1. In *Multiple Sclerosis, New Therapies and Atypical Manifestations*. Charing Cross Medical School, London.
145. *Wolinsky JS* (1997) Update on copolymer 1. The Glaxo Neurological Centre, Liverpool.
146. *Wolinsky JS* (1997) Neuroimaging of multiple sclerosis. The Walton Centre for Neurology and Neurosurgery, Liverpool.
147. *Wolinsky JS* (1997) Neuroimaging in multiple sclerosis. The Radcliffe Infirmary, Oxford.
148. *Wolinsky JS* (1997) Copolymer 1. The Radcliffe Infirmary, Oxford.
149. *Wolinsky JS* (1997) An assessment of current treatments: Corticosteroids, interferons and copolymer. Neurology Update 1997, Houston, TX.
150. *Wolinsky JS* (1997) Brain imaging in neurological practice and in clinical trials, in *Current Concepts in Multiple Sclerosis*. CME Program of the University of Texas Southwestern Medical Center, Dallas.
151. *Wolinsky JS* (1997) Multiple sclerosis; MRI. The University of Maryland, Baltimore.
152. *Wolinsky JS* (1997) New therapies for multiple sclerosis. Louisiana Neurological Society. New Orleans.
153. *Wolinsky JS, Cerreta E* (1997) Promise and Progress in MS treatment. National Multiple Sclerosis Society 10<sup>th</sup> Annual Teleconference (Central States Broadcast). Houston.
154. *Wolinsky JS* (1997) Future applications of MRS and MRI, in *Magnetic Resonance Techniques in Multiple Sclerosis*. First Advanced Course. Ospedale S. Raffaele, University of Milan.
155. *Wolinsky JS* (1997) MRS in MS, in *Festschrift* in honor of Dr. Richard T. Johnson, Biennial Meeting of the Johns Hopkins Medical and Surgical Association. Baltimore.
156. *Wolinsky JS* (1997) Immunotherapies for relapsing-remitting MS: The Copaxone® experience, and Emerging therapies for progressive MS. Multiple Sclerosis: Clinical Issues and Decisions, Summer Conference, San Francisco.
157. *Wolinsky JS* (1997) New therapies for multiple sclerosis. Darnell Army Hospital, Ft. Hood. Killeen, TX.
158. *Wolinsky JS* (1997) New therapies for multiple sclerosis. Scott and White Memorial Hospital, Temple, TX.
159. *Wolinsky JS* (1997) New directions in the management of multiple sclerosis. Neurological and Neurosurgical Society, Austin, TX.

160. *Wolinsky JS* (1997) Disease activity in multiple sclerosis as seen by MRI; Implications for clinical trials. Multiple Sclerosis Mini-Symposium, Boehringer Ingelheim Pharmaceuticals, Ridgefield, CT.
161. *Wolinsky JS* (1997) Current immunoregulatory treatments. Multiple Sclerosis Update 1997, Houston
162. *Wolinsky JS* (1997) MS - Current notions of pathogenesis and treatment, and Quantitative MRI and MSRI: Applications for a better understanding of multiple sclerosis. University of Toronto, Toronto.
163. *Wolinsky JS* (1997) Glatiramer acetate in multiple sclerosis: Clinical studies. *In* Copolimero-1 nella sclerosi multipla dai modelli sperimentali all'impiego clinico: Quali problemi quali prospettive. XXX Congresso Nazionale della Societa Italiana di Neurologia. Palermo.
164. *Wolinsky JS* (1997) With the available therapies, how should we treat a patient with relapsing-remitting multiple sclerosis? *In* Progress in the management of multiple sclerosis: New insights. Satellite Symposium to the 13<sup>th</sup> Congress of the European Committee for Treatment and Research in Multiple Sclerosis. Istanbul.
165. *Wolinsky JS* (1997) Glatiramer acetate, a longer term look at its benefits in MS. *In* New views of lesion formation in multiple sclerosis; implications for therapy. Satellite Symposium to the 13<sup>th</sup> Congress of the European Committee for Treatment and Research in Multiple Sclerosis. Istanbul.
166. *Wolinsky JS* (1997) MRS defined features of multiple sclerosis: Dynamics of disease development in MS. International Symposium: Immunopathology of Multiple Sclerosis. Vienna.
167. *Wolinsky JS* (1997) Multiple sclerosis - Current immunomodulatory therapy. The Neurological Society. Kansas City.
168. *Wolinsky JS* (1997) Quantitative MRI and MSRI applied to understanding of multiple sclerosis. University of Kansas, Kansas City.
169. *Wolinsky JS* (1997) What can we expect from MR spectroscopy? *In* MRT-Workshop: The utility of MRI for the diagnosis and monitoring of multiple sclerosis. Graz, Austria.
169. *Wolinsky JS* (1998) The pathogenesis of multiple sclerosis as viewed by MRI and MSRI. *In* Modern Therapeutic Modalities in the Management of Multiple Sclerosis. New York Academy of Sciences, New York.
170. *Wolinsky JS* (1998) Copaxone Treatment Trial Update. *In* Treatment Advances in Multiple Sclerosis. Tampa..
171. *Wolinsky JS* (1998) New therapies in multiple sclerosis. *In* The University of New Mexico Neurology Course, Santa Fe.
172. *Wolinsky JS* (1998) MRI - Clinical aspects. *In* Contemporary Issues in MS. Atlanta.
173. *Wolinsky JS* (1998) Advances in MRI techniques: Impact on clinical assessment. *In* The Role of Magnetic Resonance Imaging in Multiple Sclerosis, Jefferson College of Medicine, Philadelphia.
174. *Wolinsky JS* (1998): Multiple Sclerosis. In, Neurologic Crossfire II, Continuing Education Courses of the American Academy of Neurology. Minneapolis.

175. *Wolinsky JS* (1998) Review of the results of MR-monitored treatment trials, and Critical review of the results of the MR-monitored phase III trial using interferon beta-1b coordinated in Vancouver, both in Magnetic Resonance Techniques in Multiple Sclerosis. Second Advanced Course. Ospedale S. Raffaele, University of Milan.

176. *Wolinsky JS* (1998) Lessons from the use of MRI in clinical trials of multiple sclerosis. University of Pennsylvania, Philadelphia.